A. M. A.

NTERNS' MANUAL



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PREFACE

In 1932 the Council on Medical Education and Hospitals and the Council on Pharmacy and Chemistry of the American Medical Association cooperated in producing a handbook titled Hospital Practice for Interns In the preface of this book it was stated

> It is designed to provide the intern with some suggestions as to conduct which will be helpful to him in his service some basic data of exceeding usefulness as a reference particularly in emergencies in the laboratory and some information as to drugs which have been proved to be of merit as contrasted with those of unestablished value

The two Councils in 1938 issued a successor to Hospital Practice for Interns under a new name A M A Interns Manual While similar in character to the previous book this volume was practically new throughout differing in its external appearance as well as in content Though considerably smaller in size it contained approximately twice as much information In place of the first section of the older book Rules for Interns the Council on Medical Education and Hospitals prepared the chapter, Internships and Residencies—General Information The Council on Pharmacy and Chemistry replaced the section on drugs and their uses with a therapeutic arrangement of the drugs contained in the latest edition of the Council's book Useful Drugs In the present volume this is changed to an alphabetic arrangement The Council on Foods and Nutrition contributed the section on Diet and Nutrition which contains information to

aid in prescribing foods and for either normal or special diets The Council on Physical Medicine prepared the section on physical therapeutic measures of use to the intern There was included a statement from the Bureau of Legal Medicine and Legislation on the legal aspects of internships Finally there was added a description of the various bodies which comprise the American Medical Association in order that the intern may be thoroughly familiar with the functions of the organization The present volume follows the same general lines and represents an extensive revision to bring the material up to date

The material has been compiled and edited in the office of the Council on Pharmacy and Chemistry with the help of other officers immediately concerned The needs of the intern have been given the foremost consideration The manual is to be used as an adjunct to any hospital rule book or hospital formulary which may be in effect in the hospital in which the intern is serving The manual should prove even more useful to interns in hospitals which do not supply printed copies of rules prescriptions and procedures

CONTENTS

Part I

INTERNSHIPS AND RESIDENCIES—GENERAL INFORMATION

Prospective interns should realize that the entire program of academic medical education the internship and licensure is designed to meet the social need for safe practitioners Safe in this sense connotes competency and ethical conduct In the accomplishment of this purpose the period of internship has come to be acknowledged as having an importance scarcely less than that of all previous training in medicine

Since 1914 the Council on Medical Education and Hospitals of the American Medical Association has been evaluating and approving hospitals which are in position to provide an acceptable and planned educational service

Although certain elements in the economy of hospitals may be standardized an educational service can never be brought entirely within rigid requirements An intern therefore should realize that at this stage of his development he is expected to assume a large share of the responsibility for his own professional training

A WHAT HOSPITALS EXPECT OF INTERNS

Hospitals have as their first interest good patient care The benefits an intern receives from observation of and participation in adequate case management happily do not conflict with this primary purpose The intern contributes to good patient

care by faithful performance of certain standard protective measures routinely on each patient Apart from these essential services he can expect to assume responsibility under control as rapidly as his developing judgment and technical ability permit

To assist successive groups of incoming interns it has been found necessary to provide rules and regulations as a guide to new relationships with patients staff and administration A rule of conduct for interns could be most simply expressed by saying that the hospital and its staff expect that house officers will behave like professional gentlemen to which might be added that interns are expected to be acquainted with their duties perform them cheerfully and promptly and in their performance respect hospital property and economize in the use of supplies

The American Medical Association believes it necessary for regulations to be developed locally in keeping with varying requirements However each intern may properly expect to receive an explicit statement on the following topics

1 Intern Ho pital R lation hip
  a Re ponsibility to the uperintendent
  b Relationship to nur es—graduate and und rgraduat
  c Relation h p to other ho pital p rsonn l
  d Vacation allowance
  e Time off
  f Provis on for illne
  g Stipend and bonu
  h Information to out id agenc e (pr n or n)
  i Meal hour
2 Relation hip to Staff Int rn Committ
  a Length of service
  b Type of int rn h p— traight mix d rotat ng
  c Duties and tand ng order n the u t of rotation
  d Attendanc at confer nce
  e Quality of records and prompt n in wr tin them
  f Nature of disc plinary act on for mi conduct
  g Physical examination

- h Instruction in affiliated hospitals
- i Instruction in nursing technic
- j Instruction in social welfare
- k Instruction in outpatient service

3 Intern Staff Relationship
- a Assumption of responsibility
- b Prescribing
- c Written orders
- d Administration of narcotics
- e Emergencies
- f Attendance at rounds
- g Notification about condition of patients
- h Responsibility to pathologist and radiologist
- i Intern Resident Relationship

4 Intern Patient Relationship
- a Attitude towards patients
- b Admission routine
- c Restrictions in examination
- d Orders
- e Patients on serious list
- f Discharge of patients
- g Deaths
- h Postmortems

5 Personal Conduct
- a Appearance Regulations about uniforms
- b Response to call
- c Economy in use of supplies
- d Care of hospital property
- e Suitable decorum in quarters

6 Relationship to Outside Agencies
- a Board of Health
  - (1) Reportable diseases
  - (2) Quarantine regulations
  - (3) Birth and death certificates
- b Coroner or medical examiner cases
- c Pr s
- d Insurance papers
- e Compensation agencie
- f Welfare agencie

B WHAT INTERNS SHOULD OBTAIN FROM HOSPITALS

Interns may properly expect that the following regulations as condensed from the Essentials of

an Approved Internship be closely observed In general these regulations pertain to all types of internships although certain sections may not apply to the intern a signments classified as mixed and straight services

Instruction of Interns

The most important phase of intern instruction consists in well conducted teaching at the bedside By this is meant systematic instruction of the intern by the attending physician with an ample discussion of the history, the clinical and laboratory findings the diagnosis and the treatment of each patient

The staff, either as a whole or by departments should conduct periodically and at least once a month staff or departmental meetings in which the work of the various clinical or laboratory services is thoroughly analyzed Interns should be expected to attend and to take an active part in these meet ings Each month there should be one or more clinical pathologic conferences In addition there should be such department conferences as the cur rent activities of the various departments may require

The interns should be encouraged to read medical literature in connection with their clinical work and should preferably be assigned articles in the medical journals for special study and report

Work of the Interns

(a) *Histories* Each intern on duty in any clinical department should write or dictate the history physical examination and his own diagnostic im pression of all patients assigned to him The in tern s record should be checked within twenty four hours by a competent supervising physician calling attention to errors in observation and adding supple

mentary notes containing any relevant data which the intern may have omitted If the intern s record is acceptable the attending physician should countersign and thus approve it The intern should enter notes of progress on the record describing the patient s clinical course from time to time and make sure that all treatments or special diagnostic studies are correctly recorded When a patient is discharged the intern should write a concluding note which describes the final diagnosis and the patient s condition as he leaves the hospital This should be countersigned by the attending physician When the hospital has a shortage of interns a provision should be made whereby the interns on duty may not be burdened by an unreasonable amount of history writing In such instances it is recommended that a definite number of cases be assigned to the intern and that the other charts be completed by the attending physicians

It is especially emphasized that surgical charts should be completed promptly and except in emergencies before the patient is taken to the operating room Unless this is done the educational value of the intern s work is considerably lessened

(b) *Medical Department* This department should afford the interns an adequate amount of instruction and experience in general medicine and in such special medical technics as transfusion intravenous and other parenteral therapy and paracentesis Preferably there should be facilities for the study of patients with tuberculosis and with contagious nervous and mental diseases In connection with the work in this department it is recommended that the interns be instructed in the nutritional problems of various diseases and that they obtain a reasonable amount of technical experience under a trained dietitian

(c) *Obstetrical Department* The intern should obtain practical experience in this department by personally delivering at least ten patients while on the service He should assist at all other deliveries and not act as anesthetist for maternity patients while assigned to this department

(d) *Surgical Department* Surgical training should be planned to emphasize diagnosis and preoperative and postoperative treatment of surgical cases rather than skill in operative technic Surgical dressings should be assigned to the intern so that he may observe carefully the postoperative course

The intern should obtain instruction and experience in the administration of the various kinds of anesthetics under the supervision of a trained anesthetist

(e) *Laboratory Department* The intern should obtain experience in clinical laboratory work to perfect his skill in routine laboratory examinations and should also receive instruction from the pathologist in the procedures of pathologic diagnosis He should be present and assist at autopsies when possible and should receive instruction in technic and in interpretation of findings Every effort should be made that other assignments may not interfere with the interns attendance

(f) *X Ray Department* The roentgenologist should instruct the interns in the diagnostic and therapeutic use of x rays For this purpose conferences demonstrations and individual case studies may properly be employed

(g) *Outpatient Department* When facilities are available it is desirable that each intern should have supervised experience in outpatient work under circumstances comparable to the office practice of medicine Outpatient clinics to which interns are assigned should be operated in close affiliation with

corresponding services in the hospital thus encouraging careful follow up work and observation of patients over a long period of time

Interns Living Quarters

The hospital should provide for the intern comfortable living quarters healthful food and suitable recreational opportunities

C CHOICE OF AN INTERNSHIP

Several types of internship are approved by the American Medical Association The selection of the most suitable type depends on personal factors the requirements of medical schools for degree and state medical examining boards for licensure (see page 9)

1 Full rotating service (acceptable to most state boards) includes rotation through surgery medicine obstetrics pediatrics and the x ray and laboratory departments

2 Mixed internship (not acceptable to all state boards) provides supervised experience in two or more but not in all of the clinical divisions named

3 Straight service (not acceptable to all state boards) is an internship limited to one clinical department

The list of approved internships is published annually in The Journal of the American Medical Association Copies of this list are available on request Certain important details are published about each hospital which over a period of years have proved to be of most interest to candidates All hospitals make reports annually on internship data which are supplemented by personal inspection by members of the staff of the Council on Medical Education and Hospitals

Since it is impossible to describe all details of a service in tabular form, prospective interns should examine internship prospectuses with care and ar range for a personal visit whenever possible Cer tain institutions demand interviews some with associated competitive examination If a visit is *impracticable a choice should be influenced by the* following factors listed about in the order of their importance Advice should also be obtained from the dean of the medical school

1 Teaching ability and professional reputation of the staff

2 Two very reliable guides are the level of autopsy performance and the condition of the medical library

3 Amount and diversification of clinical material including outpatients

4 Length of service An internship should be of not less than twelve months duration Longer periods of service are desirable because they permit a more satisfactory educational program and allow the intern sufficient time in which to be trained adequately to assume increasing responsibility in various fields of medicine

5 Number of interns employed In approved hospitals the average ratio of interns to patients is approximately one intern per 600 annual admissions

6 Opportunities for promotion to higher house officerships

7 Location of hospital in relation to medical center or subsequent community practice

8 Living conditions

9 Cash allowance The principle of assigning interns an allowance for incidental expense is well established and unobjectionable Any other arrangement *which translates first emphasis from* education to salary for services rendered is contrary to the point of view of the Council and should be

approached with the greatest caution by the interns themselves

D RECORDING OF INTERNSHIPS AND RESIDENCIES

The American Medical Association now maintains complete biographic data on all physicians including the details of internships and residencies Information is secured from all hospitals employing house officers at periodic intervals It is essential that interns and residents realize the importance of this central recording system to facilitate convenient means of reference for licensing and certifying agencies Verification should be made at the end of every appointment to determine whether the hospital has reported details to the American Medical Association completely and accurately

E RELATION BETWEEN HOSPITAL AND INTERN

To avoid misunderstanding it is desirable that each intern at the time of his appointment should enter into a formal agreement with the hospital defining mutual obligations Such agreement should be honorably fulfilled by both parties The breaking of it by either a hospital or an intern is not condoned by the Council Whenever complaint is made of a breach of agreement it is the policy of the Council to ask each of the parties to submit an explanatory statement Such statements become a part of the physician s and the hospital s record

F SUBSEQUENT MEDICAL CAREERS

LICENSURE

a The following table indicates the principal details of licensure by states and territories These are subject to change Current information should be obtained directly from licensing boards

TABLE OF LICENSURE REQUIREMENTS

State	Time and Place of Examinations	Fee	Citizenship Required	Internship Required
Ala	June Montgomery	$10	Yes[1]	Yes
Ariz [2]	Jan April July Oct Phoenix	$25	Yes	No
Ark [2]	June Nov Varies	$25	Yes	No
Calif	Varies	$25	No	Foreign medical grads
Colo [2]	Jan April July Oct Denver	$25	First papers	No
Conn	March July Nov Varies	$25	First papers	No
Del	July Dover	$25	Yes	Yes[3]
D C	May Nov Washington	$25	No	Yes
Fla	June Nov Varies	$25	No	No
Ga	June Oct Augusta and Atlanta	$20	Yes	No
Idaho	Jan July Boise	$25	Yes	Yes
Ill	Jan April June Oct Chicago	$10	First papers	Yes[3]
Ind	June Indianapolis	$25	No	No
Iowa	June Iowa City Varies Des Moines	$25	Yes	Yes
Kansas	June Sept Des Kansas City	$25	Yes	No
Ky [2]	Varies Louisville	$25	Yes	No

Basic Science certificate required

1 Not applicable to citizens of Canada

2 Graduates of medical schools outside of the United States and Canada not accepted

3 Rotating internship required

TABLE OF LICENSURE REQUIREMENTS (*Continued*)

State	Time and Place of Examinations	Fee	Citizenship Required	Internship Required
La[*]	Mar June Dec New Orleans	$25	First papers	No
Maine	March July Nov Portland	$27	Yes[1]	No
Md	June Dec Varies	$20[4]	First papers	No
Mass	March July Nov Boston	$25	First papers	No
Mich	June Ann Arbor June Detroit Nov Lansing	$25	Yes	Yes[3]
Minn[*,2]	Jan April June Oct Varies	$20	Yes[1]	No
Miss	June Jackson	$10 25	Yes	No
Mo	Jan June Oct Varies	$15	Yes	No
Mont[*]	April Oct Helena	$50	Yes	Yes
Neb	April Nov Lincoln Omaha	$25	Yes	No
Nevada[2]	May Nov	$25	First papers	Yes
N H	March Sept Concord	$20	Yes	Yes
N J	June Oct Trenton	$25	Yes	Yes[3]
N M[*,2]	April Oct Santa Fe	$50	First papers	Yes
N Y	Feb June Oct Albany Buffalo N Y C Syracuse	$25	First papers	No
N C[*]	June Raleigh	$15	No	No
N D	Jan July Grand Forks	$25	Yes	Yes[3]

* Basic Science certificate required

1 Not applicable to citizens of Canada

2 Graduates of medical schools outside of the United States and Canada not accepted

3 Rotating internship required

4 $5 additional fee for graduates of foreign medical schools

TABLE OF LICENSURE REQUIREMENTS (*Continued*)

State	Time and Place of Examinations	Fee	Citizenship Required	Internship Required
Ohio[4]	June Dec Columbus	$25	Yes	No
Okla *[2]	June Dec	$25	Yes	Yes
Ore *[2]	Jan April July Dec Portland	$25	Yes	Yes
Pa	Jan Phila July Phila Pittsburgh	$25	First papers	Yes[3]
R I *	Jan April June Oct Varies Providence	$20	First papers	Yes[3]
S C[2]	June Nov Columbia	$25	Yes	No
S D	Jan July	$20	First papers	Yes[3]
Tenn	Mar June Dec Varies	$16	Yes	No
Texas	Feb June Dec Varies	$25	Yes	No
Utah[2]	June Varies	$25	Yes	Yes
Vt[2]	Feb June Burlington	$20	Yes	Yes
Va	June Dec. Varies	$25	Yes[1]	No
Wash	Jan July Seattle	$25	First papers	Yes[3]
W Va[2]	Jan March July Oct Varies	$25	Yes	Yes
Wis *[2]	Jan Madison June Milwaukee	$25	Yes	Yes[1]
Wyo[2]	June Oct Varies	$25	Yes	Yes
Alaska	March Sept Juneau	$25	Yes	Yes
Hawaii	Jan July Honolulu	$25	Yes	Yes
Puerto Rico	March Sept San Juan	$25	Yes	Yes

* Basic Science certificate required

1 Not applicable to citizens of Canada

2 Graduates of medical schools outside of the United States and Canada not accepted

3 Rotating internship required

4 Graduates of medical schools outside of the United States and Canada subsequent to 1943 limited to university schools of Great Britain

b *Reciprocity and Endorsement* Applicants should refer to a complete presentation of this subject in the latest State Board Number of The Journal of the American Medical Association, published each year in May Also consult the American Medical Directory for details about medical practice acts

c *National Board of Medical Examiners* The National Board of Medical Examiners conducts examinations and awards certificates which are granted reciprocity recognition by the licensing boards of forty five states the District of Columbia Alaska, Canal Zone Hawaii and Puerto Rico—certain boards have additional requirements Examinations are given in three parts part I and II written, and part III a practical and clinical oral examination following approved internship Parts I and II are held at Class A medical schools in any center providing five or more candidates Part III is held in twenty four established centers Fees are as follows part I $20 part II $15 part III $40

The certificate of the National Board is accepted as meeting various parts of the requirements for licensure in several foreign countries Current information concerning this feature should be obtained directly from the executive secretary of the Board 225 South Fifteenth Street Philadelphia

SPECIAL CONSIDERATIONS RELATING TO GENERAL PRACTICE

General practitioners have reported that they are called upon to meet situations in the order of frequency listed below and it would be well if interns would concentrate efforts on proficiency in these respects rather than overemphasizing special or unusual technics

GENERAL PRACTICE AND ITS SPECIAL DEMANDS

(Adapted from tables 38–39 Final Report of the Commission on Medical Education)

Office Calls	*House Calls*
1 Minor surgery	1 Upper respiratory
2 Upper respiratory	2 General medical diseases
3 General medical diseases	3 Pneumonia
4 Venereal diseases	4 Obstetrics
5 Gastro intestinal disorders	5 Minor surgery
6 Throat infection	6 Contagion
7 Vaccinations inoculations	7 Throat infections
8 Physical examinations	8 Gastro intestinal disorders
9 Gyn cology	9 Surgical diagnosis (major)
10 Skin	10 Tuberculosis
11 Urogenital diseases (including pyelitis)	11 Ear infections
12 Obstetrics	12 Gynecology
13 Nervous disorders	13 Urogenital diseases
14 Syphilis	14 Nervous disorders
15 Eye conditions	15 Infant feeding
16 Infant feeding	16 Skin
17 Tuberculosis	17 Nose and sinus infections
18 Contagion	18 Venereal
19 Ear infection	19 Physical examinations
20 Nose and sinus infections	20 Vaccinations
21 Major surgery	21 Syphilis
	22 Eye conditions

SPECIALTY PRACTICE

The most significant developments in specialty practice relate to the programs of certification by the American boards in the major clinical and laboratory divisions Regulations have been adopted by the Council on Medical Education and Hospitals which as they affect candidates may be condensed as follows

Each applicant for admission to the examination should be required to present evidence that he has met the following standards

A General Qualifications

1 Satisfactory moral and ethical standing in the profession

2 A license to practice medicine in a state terri tory or possession of the United States

B Professional Education

1 Graduation from a medical school of the United States or Canada approved by the Council on Medical Education and Hospitals of the American Medical Association Candi dates who submit credentials from institutions outside of the United States and Canada should be required to pass the examination of the National Board of Medical Examiners

2 Completion of an internship of not less than one year in a hospital approved by the same Council

C Special Training

1 A period of study after the internship prefer ably three years in clinics dispensaries hos pitals or laboratories approved by the Council on Medical Education and Hospitals and the respective specialty boards as competent to provide a satisfactory training in the special field of study In individual instances spe cialty boards may grant training credit for work done in preceptorships Candidates whose special training has been received out side of the United States should submit creden tials satisfactory to the examining boards Credits for military service may be granted by individual boards

2 This specialized training preparation shall likewise

(a) include satisfactory graduate training in the basic sciences which is considered by the American Board necessary to the proper understanding of the specialty in question

(b) be supplemented by an additional period of not less than two years of training

and/or practice in the special field concerned

(c) be evaluated by examinations which should include the basic medical sciences as well as the clinical, laboratory and public health aspects of the specialty

The regulations of the Advisory Board for Medical Specialties 102–110 Second Ave S W , Rochester, Minn B R Kirklin M D secretary—are practically identical Booklets of information relating to each specialty are available from this source or the secretaries of the various boards listed below

American Board of Anesthesiology—Paul M Wood M D 745 Fifth Ave New York City

American Board of Dermatology and Syphilology—Geo M Lewis M D 66 E 66th St New York City 21

American Board of Internal Medicine—William A Werrell M D 1 W Main St Madison 3 Wis

American Board of Neurological Surgery—Wm J German M D 310 Cedar St New Haven Conn

American Board of Obstetrics and Gynecology—Paul Titus M D 1015 Highland Building Pittsburgh 6

American Board of Ophthalmology—S J Beach M D 56 Ivie Road Cape Cottage Maine

American Board of Orthopaedic Surgery—F M McKeever M D 1136 W Sixth St Los Angeles 14

American Board of Otolaryngology—Dean M Lierle M D University Hospitals Iowa City Ia

American Board of Pathology—Robert A Moore M D 50? Euclid Ave St Louis

American Board of Pediatrics—Lee F Hill M D 3309 Forest Ave Des Moines Ia

American Board of Plastic Surgery—Robert H Ivy 1930 Chestnut St Philadelphia

American Board of Psychiatry and Neurology—F J Braceland M D 102–110 Second Ave S W Rochester Minn

American Board of Radiology—Byrl R Kirklin M D 102 Second Avenue S W Rochester Minn

American Board of Surgery—J Stewart Rodman M D 225 S Fifteenth St Philadelphia

American Board of Urology—Harry Culver M D Route 11 Sunnyside Rd Minneapolis 11

The most common, but not the only, methods of qualifying for certification are the approved residencies and fellowships lists of which are prepared by the Council and are published annually in The Journal of the American Medical Association and in each issue of the American Medical Directory Reprints of these lists are available on request

The following excerpts from the Council on Medical Education and Hospitals Essentials of Approved Residencies and Fellowships will acquaint residents with certain important relationships regarding training and conduct

The resident s term of service should cover at least twelve months

Aside from daily contact with patients and the attending staff and participation in the organized educational program the assumption of responsibility is a most valuable aspect of residency training As ability is demonstrated an increasing amount of reliance should be placed in the judgment of a resident both in diagnosis and in treatment The essential staff supervision however should never be relaxed

The resident should be encouraged to contribute to the effectiveness of hospital service by some investigative work This may take the form of research in the hospital laboratories or wards summaries of literature or the preparation of statistical summaries and analyses derived from the hospital record department

Those hospitals training both residents and interns should recognize their responsibility to both groups and not curtail too sharply the opportunities ordinarily given to interns by an excess of solicitude for the residents The residents may with profit teach the interns supervise their record work, and direct the treatments which interns administer

and/or practice in the special field con cerned,

(c) be evaluated by examinations which should include the basic medical sciences as well as the clinical, laboratory and public health aspects of the specialty

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• American Board of Surgery—J Stewart Rodman M D 225 S Fifteenth St Philadelphia

American Board of Urology—Harry Culver M D Route 13 Sunnyside Rd Minneapolis 13

MEDICAL APPOINTMENTS CONTROLLED BY STATES AND COUNTIES

These appointments are located principally in (a) institutions for the tuberculous mentally ill feebleminded epileptic deaf blind or orthopedic (b) public health departments of states counties or cities

Information concerning these appointments may be obtained through state civil service commissions superintendents of institutions and state health commissioners

PUBLIC HEALTH

Graduates interested in preparing for a career in the field of public health should be advised of the uniform regulations for appointments to state county and local public units proposed by the National Health Officers Qualifying Board Information on this subject may be obtained through the office of the United States Public Health Service Washington D C

Schools of public health are conducted at Columbia Harvard University Johns Hopkins University the University of Michigan and Yale University

TEACHING AND RESEARCH

Opportunities for a career in teaching or research are best determined through faculty advice

INDUSTRY AND INSURANCE

Industry and insurance offer a great range of opportunities in general and special practice both domestic and foreign and in related research and special investigative commissions Information is

They should not however act so as to diminish the contact of the interns with the attending men nor assume the supervisory or disciplinary functions of the staff intern committee Copies of the Essentials of Approved Residencies and Fellowships' are available on request

FEDERAL SERVICES

Information concerning internships and residencies in federal hospitals should be obtained from the following sources

1 Army Hospitals The Surgeon General United States Army Washington, D C

2 Naval Hospitals The Surgeon General Bureau of Medicine and Surgery Navy Department Washington D C

3 Public Health Service Hospitals The Surgeon General U S Public Health Service Washington D C

4 Veterans Administration No internships Chief Medical Director Department of Medicine and Surgery Veterans Administration Washington D C

5 Indian Medical Service Interior Department Lowest entrance grade associate medical officer open to *graduates of recognized* medical schools with an approved internship and *in addition* either a year of practice or a second year of internship

6 St Elizabeths Hospital Washington D C Federal Security Agency Rotating internships and residencies *in psychiatry*

7 Other opportunities for *employment* are in the food and drug control work of the Federal Security Agency as surgeon on the vessels of the Coast and geodetic survey and in a few positions in other organizations

PART II

CLINICAL AND LABORATORY DATA

A COMMON EMERGENCIES

SHOCK

The recognition of shock is not usually attended by any great difficulty The pallor perspiration and rapid thready pulse are so characteristic as to mis lead only rarely In all cases however a blood pressure determination will support the objective symptoms of serious loss of blood volume no matter from what cause With the low blood pressure there is loss of blood plasma concentration and increased viscosity of blood semiconsciousness or unconsciousness

The following steps should be instituted without delay

1 Have the attending physician notified

2 Preserve body warmth raise foot of the bed unless this may favor hemorrhage withhold nar cotics like morphine to avoid respiratory depression unless pain is severe

3 Institute proper preliminary measures for blood transfusion

4 Provided there is no danger of increasing hemorrhage or intracranial pressure inject immedi ately about 15 cc per minute intravenously plasma serum or when these are not available a solution of 5 or 10 per cent dextrose in physiologic solution of sodium chloride (from 500 to 1 000 cc) A special 6 per cent solution of gelatin may also be

obtainable through the Council on Industrial Health of the American Medical Association

MISSIONARY ACTIVITIES

Information may be obtained about medical missionary activities by application to a minister of any denomination or through the following agencies

Protestant denominations

Committee of Reference and Council
156 Fifth Avenue New York City

Roman Catholic

Catholic Medical Mission Board 10 West 17 Street
Rev E F Garesche S J President New York City

MERCHANT MARINE

Steamship companies select their own doctors without definite regulation regarding training or licensure If a ship desires to be eligible for radio pratique the qualifications of the doctor must be passed upon by the United States Public Health Service

the patient can swallow a loaf or two of table sugar or 100 cc of orange juice or 200 cc of milk are given by mouth These doses should be repeated within fifteen or twenty minutes if definite improvement has not occurred

The treatment of diabetic acidosis with or without actual coma is as follows

TREATMENT OF DIABETIC ACIDOSIS AND COMA

1 Inject insulin subcutaneously give 30 units at once follow with injections of from 5 to 20 units every one to three hours depending on the glycosuria or better the glycemia

2 Enforce absolute rest in bed the constant supervision of nurses is necessary

3 Maintain the body temperature by means of blankets and hot water bottles When diabetes is complicated with arteriosclerosis especial care must be exercised to avoid burning the skin of the feet It is better not to place hot water bottles or other heating appliances near the feet

4 Secure blood for determinations of blood sugar and carbon dioxide combining power

5 Wash the stomach with a warm 5 per cent olution of sod um bicarbonate Leave 500 cc of the solution in the stomach (See 8)

6 Wa h the lower bowel with an enema of warm soapsuds

7 Administer 1 000 cc of fluids every six hours Give this by mouth or as warm physiolog c solution of sodium chloride by retention enema If the patient is severely dehydrated give 1 000 c of st rile ph ologic solution of sod um chloride subcutaneously If there re signs of vasomotor collap e give the salt solution intravenousl An intravenous injection should take sixty minutes

8 If the patient i vomiting or unable to retain the bicarbonate solution left in the stomach or if the carbon dioxide combining powe is below 20 per cent by volume give by vein 500 cc of a sterile 5 per c nt solut on of sodium bicarbonate The injection hould t ke at l st thirty minutes Solution of sodium bicarbonate should be made up fre hly immed ately before injection nd may be prepared a follows Bring 500 cc of freshly distilled w ter to boil g and boil three minutes remove it from the flame and dissolve in it 25 Gm of clean sodium bicarbonate The bicarbonate solut on must not be boiled and must be tested with phenol red p per Boiling of the solution converts a portion of

u ed as a substitute for plasma serum or whole blood, it is less toxic than acacia formerly used for the same purpose

5 Use with caution circulatory stimulants—caffeine hypodermically if necessary, for respiratory or circulatory failure Digitalis should not be given and there is no indication for epinephrine except in cardiac arrest because peripheral arterioles are already constricted

6 Artificial respiration if necessary oxygen inhalation may be beneficial

DIABETIC COMA

The differentiation of the coma of diabetic acidosis *from the coma of hypoglycemia can be made*, usually on the signs evident at the physical examination Time doe not permit the examination of the blood and the presence of sugar in the urine is not always diagnostic *In acidosis the skin is dry* the cheeks are rosy lips are red the breathing is hyperpneic (Kussmaul type) the breath smells strongly of acetone the pulse is small and weak and the eyeballs are soft In hypoglycemia the skin is moist and pale the lips are cyanotic the respiration is apneic no acetone is detected the pulse is full or even bounding and the eyeballs are normal in tension

The treatment of coma from hypoglycemia is the administration of sugar *It* is best to inject dextro e intravenously Large doses are to be avoided, 10 or 20 Gm usually suffices Ampules containing 20 cc of sterile 50 per cent solutions of dextrose should be kept on hand If they are not at once available inject subcutaneously 0 5 cc of 1 1 000 epinephrine solution and without delay start a retention enema of 10 per cent dextrose Small amounts of granulated sugar may be placed *in the cheeks* For less severe insulin shock when

sanction of many authorities as a good first aid treatment

The administration of barbital 0 13 Gm and potassium bromide 1 Gm by means of a catheter *inserted high in the colon is highly recommended* These dosages should be modified according to age

GASTRIC HEMORRHAGE

1 Enforce absolute rest in bed

2 The patient is fed nothing by mouth but is fed with intravenous solutions of dextrose and hydrolyzed protein

3 Place an ice bag over the epigastrium unless warmth is indicated to combat collapse

4 Administer fluids by rectum subcutaneously or intravenously

5 Prepare for blood transfusion

6 Control restlessness with soluble barbital in intramuscular injection—0 2 to 0 3 Gm morphine sulfate—from 0 01 to 0 016 Gm —or other narcotic may be used if a barbiturate is not effective

PULMONARY HEMORRHAGE

1 Absolute rest in bed Head propped so that blood flows easily out of mouth

2 Codeine and if necessary a single dose of morphine sulfate from 0 01 to 0 016 Gm

3 Ice bags on suspected chest area

4 Partial immobilization of chest with sand bags

CEREBRAL VASCULAR ACCIDENTS

1 Put to bed Elevate the head of the bed Maintain good breathing airway

2 Venesection is indicated in cerebral hemorrhage

the bicarbonate to carbonate which because of its greater alkalinity is irritating to the tissues and if introduced accidentally outside of the vein may cause a serious slough Clean C P anhydrous sodium bicarbonate may be transferred with a spatula onto a clean filter paper taken from the middle of a pack In this way the proper amount of clean sodium bicarbonate may be weighed to make a 5 per cent solution the weighed material being added to cool freshly distilled sterile water While this solution is not sterile it may be used without great risk for emergency intravenous injection

If it is considered necessary to administer sodium bicarbonate subcutaneously a 1 5 per cent solution may be prepared To this a small amount of phenol red is added and the solution is then filtered through a Berkefeld candle Just before using a stream of carbon dioxide is filtered through water and then bubbled through the solution until the red color changes to orange

CONVULSIONS IN INFANCY

This relatively common manifestation in childhood often requires immediate treatment—before the etiology can be determined Nevertheless, the first step should be to take the temperature of the child if possible and examine the throat and ears Then try simple measures such as a mustard bath or pack The Pharmacopeia states that *100 square centimeters of spread plaster contains not less than 2 5 Gm of black mustard deprived of its fixed oil'* and notes that *'Before applying Mustard Plaster it should be thoroughly moistened with tepid water* The domestic mustard poultice is preferable since its strength may be modified according to the sensitiveness of the skin While for a man it may be prepared by mixing equal parts of mustard and of flour it is preferable to use twice as much flour when the poultice is to be used by a woman and four times as much flour as mustard for a poultice for a child The duration of application is from fifteen to thirty minutes An enema of soap suds has received the

string which has been previously inserted through the nostril with the aid of a nasal catheter and drawn out of the pharynx Tie gauze 6 or 8 inches from end of string so that one end of string comes out of mouth and is used to remove pack Both strings anchored on cheek The anterior portion of the nose should be packed the posterior plug being used as a background while tension is applied to the thread Packing should be removed in twelve or eighteen hours because of the possibility of infection of the ears by way of the eustachian tubes

When bleeding is secondary to systemic disease appropriate measures to combat the cause should also be instituted

UTERINE HEMORRHAGE

Uterine hemorrhage often places grave responsibility on an intern No matter from what cause the attending physician should be notified immediately However the intern should keep in mind the possibility of shock and institute proper measures such as are outlined in this manual If the attending physician is not available proceed as follows

1 Place the patient in the knee chest position
2 Prepare the field and hands aseptically
3 Wear sterile rubber gloves
4 Use a sterile Sims speculum
5 Paint the cervix and vault with 2 per cent iodine or other suitable antiseptic
6 With uterine dressing forceps pack two inch sterile gauze moistened with the antiseptic into the vagina starting at the external os and then well into the fornices Continue until the vagina is filled to capacity
7 Remove slowly before forty-eight hours

only and may be detrimental in thrombosis or embolism

3 Avoid medication especially morphine

4 Observe temperature

5 Hypertonic sucrose solution intravenously may be indicated when intracranial pressure is increased

TREATMENT OF HEMORRHAGE AFTER TONSILLECTOMY

1 Have the patient sit up and breathe deeply with the mouth open caution patient against clear ing throat and talking

2 Remove all clots

3 Apply continuous study pressure to the bleed ing point with a dry gauze sponge or apply sponge moistened with a 1 1000 solution of epinephrine or other local hemostatic agent

4 If these simple measures fail ligation is neces sary It is best to anesthetize the patient with ether Seize the bleeding point with hemostatic forceps Transfix the tissues with a needle carrying fine catgut and tie

HEMORRHAGES FROM THE NOSE

The vast majority of nasal hemorrhages occur from the anterior end of the cartilaginous septum The introduction of a gauze pack and moderate pressure will usually control this type of bleeding A rubber finger cot filled with cotton or gauze and covered with petrolatum may be placed in the nostril If simple pressure is not sufficient shrink the tissues with cocaine and epinephrine and cau terize with fused silver nitrate or with the galvano cautery

Bleeding from the posterior portion of the nose sometimes must be controlled by a posterior nasal pack Gauze in sufficient quantities is tied to a

Clotting time (slide method)	2 to 8 min
Coagulation time (venous)	6 to 10 min (Lee & White) 10 to 30 min (Howell)
Creatine	3 to 7 mg
Creatinine	1 to 2 mg
Fatty acids total	290 to 420 mg
Fibrinogen (plasma)	0 3 to 0 6 Gm
Fragility erythrocyte (hemolysis)	0 44 to 0 35 per cent NaCl
Globulin (serum)	1 2 to 3 5 Gm
Hemoglobin female	12 to 16 Gm
male	14 to 18 Gm
Hydrogen ion conc (pH)	7 35 to 7 45
Icterus index	4 to 6
Iodine (plasma)	4 to 10 micrograms
Iron as Fe	40 to 60 mg
Lactic acid	5 to 20 mg
Lecithin	170 to 260 mg
Leucocytes	6 000 to 10 000 per cu mm
Basophiles	0 to 1 per cent
Eosinophiles	1 to 3 per cent
Lymphocytes	20 to 30 per cent
Monocytes	4 to 8 per cent
Neutrophiles	60 to 70 per cent
juvenile	4 to 8 per cent
segmented	58 to 62 per cent
Lipid phosphorus	12 to 14 mg
Lipoid total	570 to 760 mg
Magnesium (serum)	1 to 3 mg
Nicotinic acid	0 25 to 0 89 mg
Nitrogen total	3 0 to 3 7 Gm
Non protein nitrogen	15 to 40 mg
Oxygen capacity	16 to 24 vol per cent
Phenols free	1 to 2 mg
Phosphat se (serum)	
acid	0 0 to 1 0 units (Shinowara Jones Reinhart)
alk line	1 5 to 4 0 units (Bodansky)
Phosphorus inorganic as P (serum)	3 0 to 4 5 mg
Platelets	125 000 to 300 000 per cu mm
Potassium (erum)	16 to 22 mg
Protein total (serum)	6 0 to 8 2 Gm
Prothromb n time	10 to 20 sec (Quick)
Reticulocytes	0 1 to 0 5 per 100 erythro cytes

B EXAMINATION OF THE BLOOD

NORMAL VALUES*

Acetone bodies total as acetone	0 8 to 5 0 mg
Albumin (serum)	3 6 to 6 7 Gm
Albumin globulin ratio	1 5 1 to 3 0 1
Amino acids	45 to 90 mg
Amino acid nitrogen	5 to 8 mg
Ammonia	0 02 to 0 04 mg
Ammonia nitrogen	0 1 to 0 2 mg
Amylase (serum)	70 to 200 mg dextrose (Elman)
	60 to 180 units (Somogyi)
Ascorbic acid (plasma)	0 4 to 2 5 mg
Bilirubin (serum) total	0 1 to 0 5 mg (Quantitative Indirect Van den Bergh)
Van den Bergh direct reacting	0 0 to 0 4 mg
Bleeding time	1 to 3 min (Duke)
	2 to 4 min (Ivy)
Calcium (serum)	9 0 to 11 5 mg
Copper	0 05 to 0 25 mg
Dextrose	70 to 130 mg
Erythrocytes female	4 2 to 5 4 million per cu mm
male	4 6 to 6 2 million per cu mm
Corpuscular vol mean	82 0 to 92 0 cu micra
Corpuscular Hb mean	28 0 to 32 0 micromicrograms
Hematocrit (vol packed cells)	
female	37 0 to 47 0 per cent
male	40 0 to 54 0 per cent
Hemoglobin conc mean	32 0 to 36 0 per cent
Carbon dioxide capacity (plasma)	55 to 75 vol per cent
Carotene (plasma)	60 to 400 micrograms
Chloride as NaCl	450 to 520 mg
(plasma)	570 to 620 mg
Cholesterol esterified	75 to 260 mg
free	37 to 130 mg
total	110 to 390 mg
Circulation time arm to tongue (sodium dehydrocholate)	9 to 16 sec
Clot retraction time	24 hrs

* Values are per 100 cc and for whole blood unless otherwise stated except where specified ranges given are for fasting specimens (when significant) and encompass extremes of adult and sex variations and differences in method

the donor s red cells by dropping two or three drops of his blood into 1 cc of citrated salt solution Deposit a platinum loopful of standard group II serum

Blood Grouping

Designated by Letter	Jansky Numbering	Moss Numbering	Agglutinogen in the Cells	Agglutinin in the Serum
O	I	IV		α β
A	II	II	A	β
B	III	III	B	α
AB	IV	I	A B	

By Landsteiner K The Human Blood Groups table 1 p 893 in The Newer Knowledge of Bacteriology and Immunology by eighty two contributors edited by Edwin O Jordan and I S Falk 1928 University of Chicago Press 1928 p 893 Reprinted by permission

on a slide and emulsify in it a loopful of the donor s red cell suspension A concave slide with two concavities is convenient the serum cell emulsion being made on the cover glasses which are to be inverted over the petrolatum ringed concavities The agglutination can be observed with a high power magnifying glass or the ⅔ inch objective Agglutination when it occurs is usually complete in from five to fifteen minutes Repeat test with group III serum

Other Agglutinogens In addition to the four main groups of agglutinogens O A B and AB there exist agglutinogens A_1 A and M and N The former represent subgroups of A and AB whereas M N and MN represent unrelated groups Determination of subgroups is considered of little significance from the standpoint of transfusion application of M and N agglutinogens is chiefly of interest in medico legal cases

Cross Typing Five cubic centimeters of blood should be drawn from both recipient and donor

Riboflavin	50 micrograms
Sedimentation rate female	0 to 20 mm per hr (Wintrobe)
male	0 to 9 mm per hr (Wintrobe)
Sodium (serum)	315 to 330 mg
Solids total	19 to 23 Gm
Specific gravity	1 048 to 1 066 (1 060)
(plasma)	1 017 to 1 035 (1 026)
Sulfates inorganic S (serum)	0 9 to 1 1 mg
Thiamine hydrochloride female	3 0 to 9 ? microgram
male	3 8 to 11 2 micrograms
Urea	15 to 30 mg
Urea nitrogen	10 to 15 mg
Uric acid	2 to 4 5 mg
Viscosity (relative to water)	3 5 1 to 5 4 1 (Hess)
Vitamin A (serum)	15 to 60 micrograms (50 to 200 U S P units)
Volume	3000 to 5000 cc (8 to 9 per cent of body weight)

THERAPEUTIC LEVELS

Bromide	Less than 50 mg
Penicillin	0 03 units per 1 cc
Quinidine (plasma)	1 5 mg
Sodium p aminobenzoate	30 to 60 mg
Streptomycin	1 to 30 micrograms per 1 cc
Sulfadiazine	10 to 15 mg
Sulfamerazine	10 to 15 mg
Sulfanilamide	5 to 15 mg
Sulfapyrazine	5 to 10 mg
Sulfathiazole	4 to 6 mg

BLOOD TYPING

It is important to perform on donors a serologic test for syphilis and to rule out other transmissible diseases

Direct Typing Lee s Technic For the regular carrying out of this method one should keep on hand the serums of individuals belonging to groups II and III To carry out the tests prepare a suspension of

sensitized by prior administration Rh negative donors must be found to transfuse such persons safely This factor is also important in that the blood of mothers of some infants with erythroblasto sis fetalis contains the Rh agglutinin The technic and interpretation of the method of typing for the Rh factor should be studied in detail as described by Landsteiner and Wiener (J Exper Med *74* 309 1941)

GLUCOSE TOLERANCE TEST

1 The patient fasts after the evening meal

2 Fasting blood and urine sugar tests are made in the morning

3 Adults of average height and build receive 100 Gm of dextrose orally 1 75 Gm of dextrose per kilogram of body weight is given for children or adults of unusual build

4 Blood and urine sugar determinations are car ried out at the end of one half hour one hour two hours and three hours

The normal curve indicates a maximum rise at the end of one hour and has practically returned to normal at the end of two hours

In diabetes mellitus high readings reach their maximum at the second hour returning gradually for an additional hour or two

In renal glycosuria glycosuria is unaccompanied by hyperglycemia

In hyperthyroidism and in hyperpituitarism ac centuations and prolongations of the normal curve occur Hypofunction produces a much flattened curve

ICTERUS INDEX

This test is a measure of the amount of bilirubin in the blood serum as indicated by the intensity of the yellow color The normal index is from 4 to 6

This may be centrifugated or the blood may be allowed to clot and the clot retract and extrude the serum Pipette off a little of the donor s serum and place a large drop on a clean slide and label D S (donor s serum) Repeat with the serum of the recipient and label R S (recipient's serum) Tease out a few corpuscles from the clot of the recipient and add these to the donor s serum mix with a glass rod and watch for agglutination Likewise add some cells from the donor to the recipient's serum, stir and watch for agglutination The serum of the donor has now been used with the cells of the recipient and the serum of the recipient with the cells of the donor If agglutination occurs in either slide, the donor is ordinarily rejected

Universal Donor Agglutination of donor s cells by recipient s serum is of more importance than the reverse situation so that in case of necessity Group O donors may be used for recipients of other groups Provided that the rate of injection is very slow the agglutinin present in the donor s serum ordinarily will be diluted enough by the recipient s serum to preclude agglutination of the recipient s cells by the donor s serum Group O blood having a high serum titer of isoagglutinins may however produce agglutination of the recipient s cells despite slow injection so that the addition to Group O blood of agglutinogens A and B sufficient to neutralize the former can be done to eliminate occasional reactions from that cause

Rh Factor The search for additional agglutinogens in human blood led to discovery of the Rh factor so designated to indicate that rhesus monkeys are the source of the substance found agglutinable by the blood of about 85 per cent of all white persons This factor has been found responsible for transfusion reactions when an Rh negative recipient receives Rh positive blood to which he was previously

icterus index be used as a guide in following mechanical obstruction of the common bile duct fluctuating values pointing to calculus rather than to neoplasm The test has also been used to follow the course of pernicious anemia

One sample of blood is sufficient for both the icterus index and the van den Bergh test The qualitative van den Bergh test is not performed unless there is an increase above the normal icterus index and is now seldom employed Most authorities prefer the quantitative van den Bergh estimation of bilirubin as described below

VAN DEN BERGH REACTIONS

1 The Immediate Direct Reaction When this reaction occurs the bilirubin is believed to be present in the form in which it occurs in the bile hence an obstructive jaundice is indicated The value of this reaction is doubtful

2 The Delayed Direct Reaction When this reaction occurs an increased production of bilirubin such as occurs in nonobstructive or hemolytic types of jaundice is indicated In the anemias chronic cholecystitis and usually in infective or toxic jaundice the reaction is of this type

3 The Biphasic Reaction This reaction is a combination of the two preceding reactions

4 The Indirect Reaction This reaction is purely quantitative All forms of bilirubin react to it Normal serum has been found to contain bilirubin in a concentration of from 0 1 to 0 5 mg per 100 cc or in terms of units from 0 2 to 1 0 unit Any amount above this is considered abnormal This reaction is the most useful because its interpretation is more certain

expressed in comparison to the color intensity of a standard 1 10 000 solution of potassium bichromate taken as 1

Five cubic centimeters of blood is drawn, placed in a clean dry centrifuge tube and allowed to clot The specimen should be taken after a period of fast ing usually just before breakfast Any hemolysis spoils the specimen Apart from this interpretation of results is rarely complicated by the presence of other substances such as xanthophyll or carotene that may impart a yellow color to the serum

This test has the advantage of being simple and easily made The icterus index rationally inter preted and performed by a simple method is a distinct aid in the detection of latent jaundice or estimation of the degree of jaundice and differentia tion of the anemias

Interpretation of Results The subnormal zone lies between 2 and 4 and is usually associated with secondary anemia of the hypochromic microcytic type found in hemorrhage and malignancy, when not accompanied by passive congestion or obstruc tion of the biliary passages Latent jaundice usually lies between 7 and 18 indicating hyperbilirubinemia without clinical evidence of jaundice in the tissues or urine Such values characterize the active phase of the primary anemias of the pernicious type and mild types of hepatitis associated with concomitant infection, circulatory disorders poisoning or gall bladder disease Frank clinical jaundice lies above 18 and may reach 150 Diseases associated with a *hemolytic jaundice may give values in this zone* but such values are most often found in the later stages of chronic biliary obstruction severe cholangitis and in severe hepatitis such as acute yellow atrophy It has been suggested that the

icterus index be used as a guide in following mechanical obstruction of the common bile duct fluctuating values pointing to calculus rather than to neoplasm The test has also been used to follow the course of pernicious anemia

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C EXAMINATION OF THE URINE

NORMAL VALUES

Acetone and aceto acetic acid	3 to 15 mg
Albumin	Slight traces only (usual tests negative)
Allantoin	*35 to 45 mg*
Amino acid nitrogen	100 to 150 mg
Ammonia	0 4 to 1 0 Gm
Ascorbic acid	20 to 50 mg
Calcium	0 1 to 0 3 Gm
Casts (12 hr concentrated)	*0 to 5000*
Chlorides as NaCl	10 to 15 Gm
Creatine adults	0 to 200 mg (usually traces only)
children	10 to 50 mg
Creatinine	*1 0 to 1 8 Gm*
Dextrose	Less than 0 1 per cent (qualitative tests neg)
Erythrocytes (12 hr)	0 to 1 0 million
Glucuronic acid	0 5 to 1 0 Gm
Hippuric acid	*0 7 Gm*
Hydrogen ion conc (pH)	5 5 to 8 0
Indican	40 to 150 mg (Sharlit)
Iodine adults	20 to 70 micrograms
children	*20 to 35 micrograms*
Iron	0 to slight traces
Lactic acid	5 to 13 mg per 100 cc
Lead	*0 05 mg per 1000 cc*
Leucocyte and epithelial cell	0 to 2 0 million
Magnesium as Mg	0 05 to 0 2 Gm
Nicotinic acid	80 to 150 mg
Nitrogen total	12 to 18 Gm
Oxalic acid	*15 to 20 mg*
Phenols total	0 to traces only
conjugated	*20 to 70 mg*
Phosphates total as P	2 5 to 3 5 Gm
Potassium as K	1 5 to 2 5 Gm
Purine bases total	16 to 60 mg
Riboflavin	500 to 800 micrograms
Sodium as *Na*	3 0 to 4 5 Gm

* Values are for 24 hour urine where pertinent unless otherwise indicated ranges given cover extremes of variation in adults and when significantly different in both sexes and in children

Solids total	70 Gm
Specific gravity	1 015 to 1 030
Sulfates total as S	0 6 to 1 2 Gm
as H_2SO_4	1 5 to 3 0 Gm
ethereal	10 per cent of total sulfates
inorganic	90 per cent of total sulfate
Sulfur neutral as S	0 08 to 0 16 Gm
Thiamine hydrochloride	60 to 500 micrograms
Titratable acidity (0 1 N alkali)	200 to 500 cc
Urea	25 to 35 Gm
Urea nitrogen	10 to 15 Gm
Uric acid	0 1 to 1 0 Gm
Urobilinogen	Not above 1 20 dilution (Wallace and Diamond)
Volume output	1000 to 2000 cc
Therapeutic Levels	
Bismuth	5 mg
Sulfonamides	100 to 200 mg per 100 cc
Vitamins (see above)	

Common Drugs and Agents Which Interfere With Urine Tests

Drug	Color
Aloes	Yellowish brown (acid) red (alkaline)
Aminopyrine (pyramidon)	Red
Betanaphthol	Olive green to reddish yellow
Cascara sagrada	Reddish yellow red (alkaline)
Chrysophanic acid	Yellow (acid) red (alkaline)
Dinitrophenol	Yellow to brownish yellow
Logwood	Unchanged (acid) reddish to violet (alkaline)
Methylene blue	Green to blue freshly voided or on standing
Phenol (carbolic acid)	Dark or smoky brownish black
Phenolphthalein	Unchanged (acid) red (alkaline)
Phenolsulfonphthalein	Red (alkaline)
Picric acid	Reddish brown
Rhubarb	Reddish yellow red (alkaline)
Santonin	Yellow red (alkaline)
Senna	Reddish yellow red (alkaline)
Sulphonal	Dark red



CONCENTRATION AND DILUTION TESTS

The Mosenthal test based on a prescribed carefully weighed diet was formerly widely used as a test of the functional capacity of the kidneys to meet demands for the elimination of varying amounts of water or solids, chiefly measurement of the volume of night urine and determination of the specific gravity of two hour specimens taken during the day The test has been subject to various modifications that offer the advantage of simplicity without an exactly measured diet

Concentration Test Patient is given about 6 P M a regular evening meal to include considerable protein with fluids restricted to not more than 200 cc No fluid or food is taken thereafter until test is completed The bladder should be emptied at bedtime and the urine discarded any passed during the night is also discarded On awakening or at 8 A M the urine is voided and saved The patient is restricted to bed for one hour when he again voids and the specimen saved The patient may then arise or remain in bed A third and final specimen is voided and saved one hour after the second The specific gravity of each specimen is recorded making any corrections necessary for temperature and albumin content If the kidneys are normal the specific gravity of at least one specimen will exceed 1 022 In severe functional impairment the maximal gravity is 1 010 in uremia it lies between 1 010 and 1 020 When edema fluid is being mobilized such as in hypertensive cardiac failure values simulating renal impairment may be found

When the Mosenthal procedure is used the ratio of the day night volume of voided urine should be from 3 1 to 4 1

Dilution (Water) Test This test places a strain on the water excreting function of the kidneys and should not be performed in the presence of edema or circulatory failure Many patients also find it diffi cult to take the large amount of water required It is best to perform the test independently of the concentration test preferably following it and after a lapse of at least 24 hours

The patient should be kept in bed early in the morning the urine is voided completely and dis carded Breakfast is omitted and instead 1200 to 1500 cc (measured) of water is taken within 20 to 30 minutes A regular dry or nephritic diet is then followed for lunch and dinner At one half or one hour intervals or as the patient desires specimens are voided and eparately saved until 12 00 noon Urine passed from 12 00 noon until the following day to the time of beginning the test the preceding day is collected at intervals or as a single specimen The volume and specific gravity of each specimen is noted The total quantity voided should lie be tween 80 and 120 per cent of the intake of which the major part is normally eliminated within the first 4 hours the specific gravity of at least one sample should be not more than 1 003 If water elimina tion is impaired the quantity eliminated in the first 4 hours may not exceed 200 cc and the specific gravity may not go below 1 010

Other Kidney Function Tests Tests for excretory function of the kidneys make use of foreign sub stances such as dyes of which the phenolsulfone phthalein (PSP) test is more widely employed The dye is injected intravenously or intramuscularly and should be interpreted accordingly from standard laboratory texts on the procedure to be followed It detects slight degrees of renal impairment less ac

curately than the concentration test but by the intravenous method, the results closely parallel the urea clearance test Bile pigment when present must be cleared to avoid interference with the dye test, and when dye excretion falls to 5 per cent resort must then be had to blood retention studies The urea clearance test like the dye test is chiefly of value in following the course of moderately severe renal disease but it requires greater care in its per formance to insure accuracy

D GASTRIC ANALYSIS

NORMAL VALUES

Acid free HCl	(bread test)	25	to	50 degrees
	(histamine test)	70	to	100 degrees
total	(bread test)	40	to	75 degrees
	(histamine test)	100	to	130 degrees
Nitrogen		40	to	60 mg per 100 cc
Pepsin		15 000	to	50 000 E units
Volume		15 cc	to	40 cc in 10 min

Tests for Free Hydrochloric Acid 1 With congo red paper which gives a blue color

2 Toepfer s reagent Add a few drops of Toepfer s reagent to the aspirated contents If free hydrochloric acid is present a red coloration results

If free hydrochloric acid is present the amount should be determined as follows Take 5 cc of aspirated contents add three drop of Toepfer s reagent and add tenth normal sodium hydroxide drop by drop from a buret until the solution becomes an orange or canary yellow color Calculate the

amount of sodium hydroxide used and multiply by 20 This gives the degrees of free hydrochloric acid Thus if 2 5 cc of tenth normal sodium hydroxide is used the calculation will be 2 5 × 20 = 50 degrees of free hydrochloric acid

If no free HCl is found a sterile solution of histamine phosphate 0 02 mg or the hydrochloride 0 01 mg per kg of body weight is injected subcutaneously with proper precautions as a stimulant to gastric secretion and the aspirated contents tested as above The presence of a large amount of regurgitated bile will vitiate results requiring repetition of the test

Test for Total Acidity To 5 cc of aspirated contents add three drops of 0 5 per cent phenolphthalein and add tenth normal sodium hydroxide drop by drop from a buret until the violet color obtained is not deepened by the addition of another drop Calculate as before To convert degrees of acidity to percentage multiply by 0 00365

Test for Lactic Acid To a test tube of distilled water add enough ferric chloride to give a faint yellowish tinge Pour half of this into a second test tube which is used as a control To one tube add a little of the filtered gastric contents or better still the ethereal extract of the contents The presence of lactic acid is indicated by a distinct deepening of the yellow color as compared with the control tube Only traces are normally present

Oppler Boas Bacilli Make a thin smear from the material aspirated from the fasting stomach Fix in flame Stain with methylene blue May be differentiated from Leptotrichia buccalis not infrequently swallowed by staining, with iodine solution

F. EXAMINATION OF SPINAL FLUID

NORMAL VALUES*

Albumin	20 mg
Calcium	4 to 7 mg
Carbon dioxide capacity	40 to 60 vol per cent
Cells total	<10 per cu mm
Chlorides as NaCl	700 to 750 mg
Creatinine in 100 cc	0 45 to 2 2 mg
Dextrose	40 to 70 mg
Globulin	6 mg
Lactic acid	6 to 25 mg
Magnesium	3 to 3 6 mg
Potassium	12 to 17 mg
Phosphates total	1 25 to 2 0 mg
Protein total	20 to 40 mg
Sodium	325 mg

* Values are per 100 cc and ranges given cover extremes of adult variations

CELL COUNT

Add one drop of freshly filtered gentian violet to a small amount of spinal fluid in a test tube By means of a pipet place one drop of this undiluted spinal fluid in the ordinary blood cell counting chamber Count the cells in five large squares take their sum and multiply by 2 This product is the number of cells in 1 cubic millimeter of undiluted spinal fluid Care should be taken to differentiate between red and white cells The gentian violet gives the white cells a delicate violet tinge and under high power this differentiation can easily be made If however doubt still exists the count should be repeated using the white cell pipet Draw a gentian violet tinged 3 per cent solution of acetic acid to mark 0 5 and spinal fluid to 11 Calculate as before and multiply the product by $^{10}/_{9}$ The result is the number of cells per cubic millimeter of undiluted spinal fluid

DIFFERENTIAL COUNT

Centrifugate a few cubic centimeters of fresh spinal fluid in an open-end centrifuge tube for about five minutes Pour off the supernatant fluid and prepare a smear of the sediment in the ordinary way Dry in air Fix by passing lightly through the flame twice Stain with Wright s stain and make the differential count in the usual way

TESTS FOR GLOBULIN PANDY S TEST

The reagent consists of a saturated aqueous solu tion of phenol crystals To 1 cc of this reagent add 1 drop of cerebrospinal fluid A bluish white cloud indicates an abnormal amount of globulin (total protein over 40 mg per 100 cc)

ROSS JONES TEST

The reagent consists of a saturated solution of ammonium sulfate Take a few cubic centimeters of this reagent in a test tube and overlay with spinal fluid If an excess of globulin is present a clear cut thin grayish white ring appears at the zone of con tact of the two fluids in a few seconds

For culture and animal inoculation serologic and colloidal gold tests send specimens of spinal fluid to the laboratory

F IMMUNITY REACTIONS

Mantoux Test The Mantoux test has supplanted largely the other types of tuberculin testing It has proved the simplest and the most accurate Ex actly 0 1 cc of the 1 10 000 dilution (0 01 mg) of Old Tuberculin U S P or 0 0002 mg of Purified Protein Derivative U S P is injected intracutane ously with a tuberculin syringe as the first test dose If negative the second test dose of 0 1 cc of the

1 100 dilution (1 mg) of O T or 0 005 mg of P P D is similarly injected No control is needed when P P D is employed The reaction is read at the end of forty eight hours Varying degrees of reaction are indicated by the terms 1 + 2+, 3 +, and so on

Dick Test The Dick test is the intracutaneous injection of 0 1 cc of scarlet fever strepto occus toxin A tuberculin syringe is used The reaction is read between twenty and twenty four hours A positive reaction is indicated by the appearance of a reddened circular area over 1 cm in diameter re sembling a typical scarlet fever rash

Schick Test One tenth cc of diphtheria toxin for the Schick test containing $^1/_{50}$ minimum lethal dose for the guinea pig is injected into the skin A similar amount of specially treated toxin is used as a control in older children or adults it can be omitted in children under 6 years who have not been pre viously immunized In patients lacking immunity to diphtheria, a characteristic reddened area usually appears at the end of 24 to 48 hours but it is best to delay interpretation of the reaction until an elapse of 5 to 7 days, pseudopositive reactions tend to fade early Absence of erythema and edema or a papule not more than 0 5 cm in diameter constitutes a negative reaction

G SERUM ADMINISTRATION

Many immune serums of value in the treatment of specific infections are made from horse serum to which patients may be allergic When such serum is to be administered it is important (1) to obtain a careful history concerning (a) allergy in the patient or family (b) horse asthma and (c) previous in jection of immune serum and (2) to perform a skin test with normal horse serum Using the specific

immune serum to be administered is not recommended since reaction to it may be due to cause other than serum sensitivity

Skin Test Inject intracutaneously 0 02 cc of a 1 10 dilution (1 100 in horse asthmatics) of normal horse serum Read reaction in ten minutes and record as negative slight moderate or marked positive If positive the eye test should also be performed

Eye Test One drop of normal horse serum is instilled into conjunctival sac undiluted serum is used in adults with slight positive skin reaction 1 10 dilution in children or in adults with moderate to marked positive skin reaction 1 100 dilution in horse asthmatics or in patients with both positive allergic history and marked kin reaction One drop of 1 1000 solution of epinephrine hydrochloride instilled into the eye allays any severe reaction

Interpretation When both history and skin test are negative immune serum is usually safely administered by any route when there is a positive history but negative skin test serum administration may be considered safe by any route if given cautiously with solution of epinephrine in readiness to combat any signs of immediate reaction with positive skin test and negative eye test immediate reaction is possible so that intravenous administration should be avoided or heterologous serum employed When the latter is not available desensitization may be carried out as described below when both skin and eye tests are positive immediate serum reactions of a severe or dangerous character are extremely likely especially with a history of allergy Serum administration to such patients should be abandoned unless a heterologous type is available because even desensitization is likely to produce

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Part III

DRUG ADMINISTRATION

The primary aim of the physician should be to eradicate the fundamental etiologic factor responsible for disease but the management of the psyche of the patient and the relief of his symptoms are of equal importance The significance of the symptoms that present themselves may be negligible so far as the mechanism of the disease is concerned but fundamental from the point of view of the mental peace of the patient No physician can afford to neglect the chief complaints of his patient and if the symptomatic disturbances cannot be relieved or ameliorated through physical measures then this should be attempted through sympathetic reassurance The physician should make thorough and critical bedside observations of the patient before and after the application of therapeutic measures

A COMBINED ADMINISTRATION OF DRUGS

Drugs simultaneously present in the body may influence each other s action desirably or undesirably The quantitative changes resulting from combinations may manifest themselves in an increased effect (synergism) or a decreased general or local effect (antagonism) of the individual drugs One drug moreover may also alter qualitatively the action of another Combinations of drugs were very popular in the past Experimental pharmacology and rational therapeutics have shown that in general mixtures offer no advantages and often

immediate reactions that will prevent administration of sufficient serum Desensitization of "horse asthmatics' should never be attempted

Desensitization When immune serum is to be given subcutaneously or intramuscularly to serum sensitive patient inject *subcutaneously* 0 3 cc of 1 1000 solution of epinephrine hydrochloride simultaneously *with 0 05 cc of the specific serum (they* may be given together in the same syringe without damage to the serum) repeat serum injection at half hour intervals giving in order 0 1 cc 0 2 cc 0 5 cc 1 cc 2 cc 4 cc until total amount is administered repeat epinephrine injection of from 0 3 cc to 0 5 or 1 cc (dosage modified in children according to age) as needed at hourly intervals until all serum has been given

When serum is to be given intravenously to a serum sensitive patient proceed as above giving serum doses *subcutaneously* until the 1 cc dose has been given using also the same epinephrine dosage given at hourly intervals until all the serum has been administered one half hour after giving the 1 cc dose of serum intravenous injection of 0 1 cc diluted to 1 cc with isotonic sodium chloride solution is made *slowly* repeating at half hour intervals giving in order 0 2 cc diluted to 1 cc 0 5 cc diluted to 1 cc then undiluted 1 cc 2 cc 4 cc etc until all remaining serum is injected intravenously At the least sign of an immediate reaction discontinue injection immediately and inject 1 1000 solution of epinephrine hydrochloride 0 3 to 0 5 cc When symptoms disappear injections may be resumed again but at a much lower level

150 Such a rule is but approximate Children require proportionately high amounts of certain drugs, such as digitalis and rather low amounts of others such as morphine Sex and age occasionally alter the effect of a drug qualitatively as well as quantitatively Morphine excitement is common in females atropine psychosis in old age Diseases may influence dosage through altered absorption destruction or elimination or through altered susceptibility of the specific tissues Quinine salicylates atropine iodine-containing drugs and the alkaloids of opium may produce undesirable reactions in susceptible persons Chloral hydrate opium quinine and salicylates are apt to cause nausea Arsenic bromides iodides barbiturates aminopyrine and cinchophen often cause skin rashes Atropine and thyroid may produce a diffuse flushing of the skin

Repetition of Dose The frequency of dosage is determined by the condition of the patient or if a continued effect is desired by the rate of elimination of a single dose Epinephrine alcohol caffeine chloral hydrate iodides salicylates physostigmine salicylate solution of pituitary and strychnine are eliminated within hours hence the intervals of repetition are measured in hours Arsenic barbituric acid derivatives bromides digitalis mercurial preparations and thyroid are eliminated more slowly in terms of days

C METHODS OF ADMINISTRATION

The choice of the channel by which drugs may be introduced into the human body depends on whether or not the drug should act through systemic absorption or local application as well as on its fate on administration through the various channels

Oral Administration This is the most convenient

interfere with a critical evaluation of the effect of the most important therapeutic agent administered as well as with an interpretation of the changes in the condition of the patient It is advisable to employ single therapeutic measures unless the advantages of a combination are established

B DOSAGE

The dose of a drug is that amount which i required to induce a desired action The same drug in different amounts produces different effects The optimal dose of a drug is influenced by numerous factors hence it is misleading to think that an average dose given by the U S P or other publications is necessarily the optimal amount for the individual patient The various toxic manifestations of a drug must be considered in estimating the optimal dose *Idiosyncrasy* or abnormal reaction to a drug is an indication for its discontinuance *Drug hypersensitivity* is responsible for idiosyncrasy to a number of drugs If a person requires unusually large amounts of a drug in order to induce an effect one speaks of tolerance *Tolerance* may be caused by nonabsorption rapid elimination habituation or other altered bodily functions

Among the factors influencing the single dose age, weight sex pregnancy altered physiologic states of the body and diseases have an important role As a rule above the age of 20 there is little necessity for changing the dose unless specifically indicated at the age of 10 years the dose is one half that of the adult, at 5 years about one fourth at $2^1/_2$ years about one eighth and at 1 year about one twelfth

Clark s rule for calculating the dose for children is one of the most exact Multiply the adult dose by the weight of the child in pounds and divide this by

two fingers The injection should be rather slow *Protoplasmic irritants may cause sterile abscesses*

Intramuscular Administration Intramuscular injections are usually made into the deltoid gluteal or lumbar muscles Absorption is more prompt and often more complete than after subcutaneous administration Irritating drugs are less apt to cause abscesses after intramuscular administration In making an intramuscular injection the needle attached to the syringe should be plunged into the muscle Before expulsion one should aspirate to be sure the tip of the needle is not in a vessel The technic of administration is essentially the same as in subcutaneous injection

Subdural Administration Subdural injections are used for the introduction of drugs or serums into the central nervous system The technic is the same as that for a diagnostic lumbar tap This method is not without danger and should be used only when there are specific indications for it In case of spinal anesthesia it is essential that the local anesthetic should not reach the medulla The existence of increased intracranial pressure evidenced by the presence of choked disk contraindicates spinal puncture or necessitates special caution in its performance In such cases it should be performed only after consultation with a visiting or resident physician

The patient should be in either reclining or sitting position If reclining his back should be along the edge of the bed with the neck bent and the knees drawn up thus curving the spine An assistant may be required to hold the patient in this position A hard board above the mattress if the operation is not performed on an examination table may also be of help If the patient is sitting he should bend forward sufficiently far to obtain curvature of the

method Drugs that are destroyed in the gastro-intestinal canal or before they enter into the systemic circulation are ineffectual when administered in this way unless local action on the gastro-intestinal tract is desired

Rectal Administration When because of vomiting or for other reasons oral administration is to be avoided drugs may be absorbed from the rectum after a cleansing enema The medicament is introduced through a rectal tube which is inserted about 10 inches (25 4 cm) If the medicament is irritating it may be advisable to mix it with starch After the solution or thin paste is injected the rectal tube should be removed slowly in order to prevent the expulsion of the substance The rectal dose is often the same as or smaller than that for oral administration but no fixed ratio exists between the oral and rectal dosages Drugs administered by rectum may by retroperistalsis be carried back as far as the cecum and thus be absorbed by the colon

Subcutaneous or Hypodermic Administration Drugs administered in small doses into the subcutaneous tissues are promptly absorbed through the lymphatic or blood capillaries into the systemic circulation This method is indicated if a prompt effect is desired or if the drug is destroyed on oral administration The injections should be given where the subcutaneous tissues are loose and muscular movements not pronounced over the deltoid below the angle of the scapula above the buttock or in the abdominal wall Care should be taken to insure avoidance of the sciatic nerve in intramuscular injections into gluteal muscles The skin should be prepared aseptically The medicament should be drawn into the syringe aseptically and all air expelled The needle fitted tightly on the syringe should be inserted while the skin is pinched between

In severe reactions subcutaneous injection of 0 5 cc (*i* minims) of epinephrine solution may be given Local thrombosis of the vein in rare instances may follow intravenous injections in which case immobilization and cold should be applied locally

In case the veins of the forearm are not available the superficial veins of the hand or foot the jugular vein the femoral vein or the veins of the penis may be used In infants the jugular vein or with extreme care the longitudinal sinus of the skull may be used

The Abuse of the Subcutaneous Intramuscular and Intravenous Administration of Drugs These channels of administration are often used when they offer no advantages over oral administration whereas they should be used only if there are specific indications when there is partial or complete destruction or imperfect absorption in or imperfect absorption of substances from the gastro-intestinal canal or when in an emergency the drug has to reach the vital organs rapidly (within minutes or seconds)

Inhalation This method is used for gaseous volatile and atomized substances The rich pulmonary capillaries absorb gases and finely atomized solutions promptly Occasionally atomized sprays may be inhaled These act locally on the bronchioles or systemically after absorption

Local Application to the Skin Open Wounds or Mucous Membranes This method is used as a rule for local effect but systemic effects may also be induced in this way

D PRESCRIPTIONS

A prescription is a written order from the physician to the pharmacist for the dispensing of medicinal agents Prescriptions may be written in Latin or in

spine A large skin area over the lumbosacral region is made sterile The needle with a stylet is inserted midway between the spinous processes of the third and fourth lumbar vertebrae It is pushed forward through the soft tissue at a maintained horizontal and slightly cranialward tilt A slight snap often indicates the perforation of the ligaments and dura, after removal of the stylet, an amount of cerebro spinal fluid equal to or greater than the amount of the medicament to be given is allowed to flow through the needle The drug is then slowly infused Following diagnostic or therapeutic tap of the sub dural space the patient should receive one or two glassfuls of water and be kept in bed for from twelve to twenty four hours in the horizontal position pref erably on the stomach for the first three hours

Intravenous Administration Intravenous injec tions are indicated when in an emergency a drug has to act promptly and when a drug is irritating to destroyed in or not absorbed by other channels of administration The solutions must be clear substances which precipitate with serum are ex cluded The dose administered in a single injection should be rather small Extreme caution should be observed as to the sterility and freshne s of the isotonic solution of sodium chloride which is usually employed As a rule the antecubital veins are selected for puncture A tourniquet is applied over the upper third of the arm with moderate pressure to produce venous stasis The needle is then intro duced into the vein through the sterile skin the piston is drawn back and as soon as blood appears at the end of the syringe the point of the needle is shoved anteriorly from 0 5 to 1 cm within the vein the tourniquet is removed and the solution is in jected slowly If a chill follows the injection the patient should be covered warmly and hot water bottles should be applied along the lower extremities

PRESCRIPTION OF ALCOHOL

With the revocation of the 18th amendment to the Constitution the federal regulations concerning the medicinal prescription of alcohol became obsolete Restrictions remain however, in some states The individual physician should inquire as to what regulations if any are imposed by the state in which he is practicing

PRESCRIPTION OF NARCOTICS

Under the provisions of a federal internal revenue law the Harrison Act certain rules must be followed in the dispensing of apomorphine cocaine codeine ethylmorphine morphine cannabis dilaudid opium and coca derivatives and other substances that may be included from time to time by amendment of the law Physicians must register with and obtain a special license and registry number from the collector of internal revenue of the district from whom a circular of information may be obtained Narcotic prescriptions must be signed by the physician and his address and narcotic registry number and the date of the prescription must be stated The full name and address of the patient should be recorded The physician need not keep a copy or record of the prescription Prescriptions for narcotics must not be refilled

Certain articles are specifically exempted and may be prescribed without formality or bought without prescription for legitimate use The more important of these exemptions are Camphorated Tincture of Opium Compound Mixture of Opium and Glycyrrhiza Lead and Opium Lotion and all preparation for application on the skin if they contain ingredients that render them unfit for internal use

The conditions for which narcotics may be pre

English A prescription consists of the following parts

1 Superscription The heading written ℞ which is an abbreviation of recipe or take

2 Inscription The body of the prescription giving the ingredients and their amount The ingredients are enumerated in the following order

(a) The base—the drug with the most important action

(b) The adjuvant—the drug or drugs that may improve the action of the base

(c) The corrective—a substance used to modify or correct an undesirable action of the base or adjuvant

(d) The vehicle—an indifferent substance used for dilution

3 Subscription Instructions to the pharmacist

4 Signature Directions to the patient as to the size and frequency of the dose or other instructions The signature is indicated by the abbreviation *Sig* The directions should be complete and specific

5 Ending The name of the patient the name of the prescriber and the date and if necessary the narcotic number

THE CONSTRUCTION OF A PRESCRIPTION

In writing a prescription the name of the most active principle is first written Then those drugs that may modify its action are added The form of pharmaceutic preparation for administration is chosen and such vehicles as will make the mixture pleasant are added Incompatibilities of course, should be avoided The total amount of the mixture to be prescribed is estimated by multiplying the total number of doses by the size of a single dose The single dose of each ingredient also is multiplied by the total number of doses Prescriptions should be written preferably in the metric system

	dosis	a dose
ext	extractum	extract
f ft	fiat or fiant	let it be made let them be made
fldext	fluidextractum	fluidextract
	gargarisma	a gargle
gtt	gutta	a drop
	haustus	a draft
	hora	hour
	mane	morning
M	misce	mix
mist	mistura	mixture
	non	not
	non repetatur	do not repeat
	nox	night
no	numerus	number
	omnis	every
	ovum	egg
	pars	a part
pil	pilula	pill
p r n	pro re nata	according to necessity
pulv	pulvis	powder
q s	quantum sufficit or sufficiat	as much as necessary
	quaque hora	every hour
sat	saturatus	saturated
	secundum artem	according to the art
ss	semisse	(and) a half
S Sig	signa	label
s o s	si opus sit	if necessary
sol	solutio	solution
stat	statim	at once
syr	syrupus	syrup
	talis—e	such
	tere simul	rub together
t i d	ter in d e	three times a day
tr	tinctura	tincture
ung	unguentum	ointment
	vitellus	yolk of an egg

E WEIGHTS AND MEASURES

The Metric System The metric or decimal system is based on a unit of length the meter (M),

scribed include (a) all acute conditions at the dis cretion of the prescriber (b) incurable diseases (cancer, advanced tuberculosis, etc) under certain restrictions (c) the treatment of addicts, narrowly restricted

Interns may give prescriptions containing nar cotics only if they have obtained their narcotic license or if they sign their names in the order book of the hospital dispensary which possesses a license

If a physician dispenses narcotics directly *he has* to follow the same rules as a druggist He must *keep a record of the amount and nature of the drugs* dispensed as well as the names and addresses *of* the *patients If a physician wishes to obtain* narcotic drugs to be applied administered or dispensed by himself *he must* obtain special order forms *from* the local collector of internal revenue authorizing him to purchase them

Prescription Latin

Abbreviation	Word or Phrase	Meaning
aa	ana	of each
a c	ante cibum	before meals
ad lib	ad libitum	at pleasure freely
	aequalis	*equal*
aq	aqua	water
	aqua bulliens	boiling water
aq dest	aqua destillata	distilled water
	aqua fervens	hot water
	aqua fontana	spring water
	bene	well
b i d	bis in die	twice a day
	cacheta	*cachet*
	charta	a medicated paper
chart	ch rtula	a powder
	ibu	*a meal*
	collyrium	eye wa h
co comp	compositus	compound
dil	dilutus	dilute

appellation Thus gr xx not 20 gr The ones except the last are dotted and the last one is formed like a j thus ʒiij ʒvj etc Fractions except one half are written as common fractions gr 1/10 not gr 0 1 One half is written ss

Equivalents of Metric and Apothecary Systems The approximate dose equivalents in the following table represent the quantities which would be prescribed *under identical conditions* by *physicians* trained respectively in the metric or in the apothecary system of weights and measures

When prepared dosage forms such as tablets capsules pills etc are prescribed in the metric system the pharmacist may dispense the corresponding approximate equivalent in the apothecary system and vice versa This does not however authorize the alternative use of the approximate dose equivalents given below for specific quantities on a prescription which requires compounding nor in converting a pharmaceutical formula from one system of weights or measures to the other system for such purposes exact equivalents must be used (see U S P XIII Table page 913)

Metric Doses with Approximate Apothecary Equivalents

Weights			
Metric	Approximate Apothecary Equivalent	Metric	Approximate Apothecary Equivalents
30 Gm	= 1 ounce	75 mg	= 1 1/ gr
15 Gm	= 4 drachms	60 mg	= 1 gr
10 Gm	= 2 drachm	50 mg	= / gr
7 5 Gm	= 2 drachms	40 mg	= / gr
6 Gm	= 90 g	30 mg	= /4 gr
5 Gm	= 75 gr	25 mg	= gr
4 Gm	= 60 gr (1 drachm)	20 mg	= gr
3 Gm	= 45 gr	15 mg	= 1/ gr
2 Gm	= 30 gr (/ drachm)	12 mg	= 1/ gr
1 Gm	= 15 gr	10 mg	= /6 gr

from which the unit of weight the gram (Gm) and that of capacity the liter (L) are derived

A cube each edge of which measures 10 centimeters is the unit of capacity the liter

The unit of weight is the gram This is the weight of 1 cubic centimeter (cc) of distilled water at 4 degrees C

A quantity of one thousand times the unit is expressed by prefixing the Greek, kilo one hundredth

METRIC SYSTEM

Weight	
0 milligrams	1 centigram
100 centigrams	1 gram
1000 grams	1 kilogram
Volume	
1000 cubic centimeters	*1 liter*

of the unit is expressed by prefixing the Latin centi one thousandth of the unit by prefixing the Latin milli

Quantities of less than 1 milligram (mg) are expressed as fractions of a milligram The quantities with whole numbers and decimal fractions are always written with Arabic figures

APOTHECARIES SYSTEM

Weight	
60 grains	1 dram
8 drams	1 ounce
12 ounces	1 pound
Volume	
60 minims	1 fluidrachm
8 fluidrachms	1 fl idounce
16 fluidounces	1 pint
8 pints	1 gallon

The Apothecaries System In writing the apothecaries measure in prescriptions the figures are written in the Roman system and placed after the

The Council on Pharmacy and Chemistry has voted to use exclusively the metric system in any publication for which it has sole responsibility

Formerly almost every country had its own system of weights and measures a practice which resulted in much confusion The one system which is used almost universally and exclusively in the exact sciences is the metric system which is based on the decimal system and has for its units the meter and the gram Other systems still enjoying some popu larity albeit decreasing popularity are the Apothe caries or Troy weight which is used in prescriptions the Avoirdupois or Imperial Weight which is used in commerce and the United States Apothecaries or Wine Measure which is not to be confused with the British Imperial System Examples of the denomi nations of each system are Apothecaries—grain scruple (20 grains) drachm (or dram 60 grains) Troy ounce (480 grains or 8 drachms) Avoirdupois—grain ounce (437½ grains) pound (16 ounces or 7 000 grains) and the ton (2 000 pounds) Wine Measure—minim fluidrachm (60 minims) Fluid ounce (8 fluidrachms or 480 minims) pint (16 fluid ounces) quart (32 fluidounces) For fairly accurate conversion

1 Gm = 15 43 grains
1 Gm = 0 2572 dram
1 Gm = 0 03215 Troy ounce
1 Gm = 0 03527 Avoirdupois ounce
1 Gm = 0 0027 Avoirdupois pound

1 grain = 0 0648 gram (Gm)
1 grain = 64 8 milligrams (mg)
1 dram = 3 888 grams (Gm)

1 Troy or Apothecary ounce = 31 1 grams (Gm)
1 Avoirdupois ounce = 28 35 grams (Gm)
1 Avoirdupois pound = 453 6 grams (Gm)

TABLE OF METRIC DOSES WITH APPROXIMATE APOTHECARY EQUIVALENTS (*Continued*)

Weights

Metric	Approximate Apothecary Equivalents	Metric	Approximate Apothecary Equivalents
0 75 Gm	= 12 gr	8 mg	= $^{1}/_{8}$ gr
0 6 Gm	= 10 gr	6 mg	= $^{1}/_{10}$ gr
0 5 Gm	= $7^{1}/_{2}$ gr	5 mg	= $^{1}/_{12}$ gr
0 45 Gm	= 7 gr	4 mg	= $^{1}/_{15}$ gr
0 3 Gm	= 5 gr		
		3 mg	= $^{1}/_{20}$ g
0 25 Gm	= 4 gr	1 5 mg	= $^{1}/_{40}$ gr
0 2 Gm	= 3 gr	1 mg	= $^{1}/_{60}$ gr
0 15 Gm	= $2^{1}/_{2}$ gr	0 8 mg	= $^{1}/_{80}$ gr
0 1 Gm	= 2 gr	0 6 mg	= $^{1}/_{100}$ gr
0 1 Gm	= $1^{1}/$ gr	0 5 mg	= $^{1}/_{1\ 0}$ gr
		0 4 mg	= $^{1}/_{1\ 0}$ gr
		0 3 mg	= $^{1}/_{200}$ gr
		0 25 mg	= $^{1}/_{250}$ gr
		0 2 mg	= $^{1}/_{3\ 0}$ gr
		0 15 mg	= $^{1}/_{\ 00}$ gr
		0 1 mg	= $^{1}/_{6\ 0}$ gr

Liquid Measures

Metric	Approximate Apothecary Equivalents	Metric	Approximate Apothecary Equivalents
1000 cc	= 1 qt	5 cc	= 80 min
750 cc	= $1^{1}/_{2}$ pt	4 cc	= 1 fl drachm
500 cc	= 1 pt	3 cc	= 45 min
250 cc	= 8 fl oz	2 cc	= 30 min
200 cc	= 7 fl oz	1 cc	= 15 min
100 cc	= $3^{1}/_{2}$ fl oz		
		0 75 cc	= 12 min
50 cc	= $1^{\ }/_{4}$ fl oz	0 6 cc	= 10 min
30 cc	= 1 fl oz	0 5 cc	= 8 min
15 cc	= $^{1}/_{2}$ fl oz	0 3 cc	= 5 min
10 cc	= $2^{1}/_{2}$ fl drachm	0 25 cc	= 4 min
8 cc	= 2 fl drachm		
		0 2 cc	= 3 min
		0 1 cc	= $1^{1}/_{2}$ min

NOTE—A cubic centimeter (cc) is the approximate equivalent of a milliliter (ml)

add 32 which will yield the Fahrenheit equivalent

Method of Converting Fahrenheit to Centigrade Subtract 32 from the Fahrenheit reading and multiply by 5/9 the product is the centigrade equivalent

G SOLUBILITIES

Definitions of Solubilities

Terms and abbreviations		1 part soluble in
vs	very soluble	less than 1 part of solvent
f	freely soluble	1 to 10 parts of solvent
sol	soluble	10 to 30 parts of solvent
sps	sparingly soluble	30 to 100 parts of solvent
sls	slightly soluble	100 to 1 000 parts of solvent
vsl	very slightly solvent	1 000 to 10 000 parts of solvent
pri	practically insoluble	more than 10 000 parts of solvent
ins	insoluble	entirely insoluble
part s	partially soluble	soluble and insoluble portions
slow s	slowly soluble	enters solution slowly
misc	miscible	miscible in all proportions
dec	decomposed	changes chemically in solution
	not given	no solubility stated

Examples of solubility of drugs in common use follow The solubilities are for distilled water at approximately 25 C and for the official U S P alcohol at the same temperature and indicate the number of parts by measure of the solvent required to dissolve 1 part by weight of the substance

	Soluble in	
Substance	Parts of Water at 25 C	Parts of 95% Alcohol at 25 C
Acacia U S P	2	ins
Acetanilid U S P	190	3 4
Acetophenetidin U S P	1 310	15
Acetylsalicylic Acid U S P	300	5
Adrenal Cortex Extract N N R	sol	
Alcohol U S P	misc	
Aloin U S P	sol	sol

Exceptions appear in footnotes

1 cubic centimeter = 16 23 minims
1 milliliter = 16 23 minims
1 milliliter = 0 2705 fluid dram
1 milliliter = 0 0338 fluid ounce
1 milliliter = 0 00211 pint
1 milliliter = 0 000264 gallon

1 minim = 0 06161 cubic centimeters (cc)
1 fluid dram = 3 6966 cubic centimeters (cc)
1 fluid ounce = 29 57 cubic centimeters (cc)
1 pint = 473 cubic centimeters (cc)

This degree of exactness however is not usually necessary in figuring dosages and round figures are used in the accompanying tables of approximate equivalents which will be found more convenient for translating dosages from one system to the other However further approximation by the use of household units may cause greater errors every one should remember that a minim does not necessarily equal one drop a drop will vary with the viscosity and surface tension of the fluid and the nature of the dropping container A teaspoon will hold from 4 cc *(1 fluid dram) to 7 cc a dessert spoon from 9 to* 14 cc a tablespoon from 15 to 22 cc a wine glass from 50 to 90 cc a teacup from 125 to 240 cc and a tumbler from 200 to 300 cc

The following table of approximations may be convenient for translating pounds into kilograms

11 pounds = 5 kilograms	110 pounds = 50 kilograms
22 pounds = 10 kilograms	132 pounds = 60 kilogram
33 pounds = 15 kilograms	154 pounds = 70 kilograms
44 pound = 20 kilograms	176 pounds = 80 kilograms
55 pounds = 25 kilograms	198 pound = 90 kilograms
66 pounds = 30 kilogram	220 pounds = 100 kilogram
88 pounds = 40 kilogram	242 pound = 110 kilograms

F TEMPERATURE CONVERSIONS

Method of Converting Centigrade to Fahrenheit Multiply the centigrade reading by $^9/_5$ (or 1 8) and

EXAMPLES OF SOLUBILITIES (*Continued*)

Substance	Solubility: Parts of Water at 25° C	Solubility: Parts of 95% Alcohol at 25° C
Castor Oil U.S.P.		misc *
Chaulmoogra Oil N.F.		sps
Chenopodium Oil of N.F.		8†
Chiniofon U.S.P.	25	ins
Chloral Hydrate U.S.P.	0.25	1.3
Chloroazodin U.S.P.	vs	sps
Chlorobutanol U.S.P.	125	1‡
Chloroform U.S.P.	210	misc
Chrysarobin U.S.P.	vsl	385
Cinnamon Oil of U.S.P.		2†
Citric Acid U.S.P.	0.5	1.8
Clove Oil of U.S.P.		2†
Cocaine U.S.P.	600	6.5
Cocaine Hydrochloride U.S.P.	0.4	3.2
Cod Liver Oil U.S.P.		sls
Codeine U.S.P.	120	2
Codeine Phosphate U.S.P.	2.3	325
Codeine Sulfate U.S.P.	30	1,280
Colchicine U.S.P.	22	fs
Cresol U.S.P.	50	misc
Cupric Sulfate U.S.P.	3	500
Cyclopropane U.S.P.	2.7§	fs
Dextrose U.S.P.	1	59
Digitoxin U.S.P.	pri	sol
Diphenylhydantoin Sodium U.S.P.	fs	sol
Emetine Hydrochloride U.S.P.	fs	fs
Ephedrine U.S.P.	sol	sol
Ephedrine Hydrochloride U.S.P.	3	14
Ephedrine Sulfate U.S.P.	fs	fs ¶
Epinephrine U.S.P.	sls	sls
Ergonovine Maleate U.S.P.	36	120
Ergotamine Tartrate U.S.P.	500	500
Erythrityl Tetranitrate Tablets U.S.P.	parts	parts

Dehydrated alcohol
† 70% alcohol
‡ 90% alcohol
§ 15° C
¶ Hot alcohol

EXAMPLES OF SOLUBILITIES (*Continued*)

S bsta c	Solubl n P t f W t at 25 C	P t f 95 Al b l t 5 C
Aminophylline U S P	5	ins
Ammonium Carbonate U S P	4	
Ammonium Chlorid U S P	2 6	100
Amphetamine Sulfate N N R	fs	sl
Amyl Nitrite U S P	pri	mi c
Antimony and Pot Tartrate U S P	12	ins
Apomorphine Hydrochloride U S P	50	50
Arsenic Trioxide U S P	slow s	sls
Arsphenamine U S P	sol	sol
Ascorbic Acid U S P	3	30
Atropine U S P	455	2
Atropine Sulfate U S P	0 4	5
Balsam Peruvian U S P	pri	sol
Balsam Tolu U S P	pri	sol
Barbital U S P	130	14
Barbital Sodium U S P	5	sl
Barium Sulfate U S P	ins	in
Bismuth and Pot Tartrate U S P	2	ins
Bismuth Sodium Tartrate N N R	3	
Bismuth Subcarbonate U S P	ins	ins
Bismuth Subnitrate N F	pri	ins
Boric Acid U S P	18	18
Butesin Picrate N N R	vsl	sol
Butyl Aminobenzoate U S P	vsl	sol
Caffeine U S P	46	66
Caffeine and Sodium Benzoate U S I	1 1	30
Calcium Carbonate Precipitated U S P	pri	ins
Calcium Chloride U S I	1 2	10
Calcium Gluconate U S P	30	ins
Calcium Hydroxide U S P	630	ins
Calcium Lactate U S P	20	pri
Calcium Phosphate Tribasic U S P	pri	ins
Camphor U S P	800	1
Carbarsone U S P	sls	sls
Carbon Dioxide U S P	f	
Carbon Tetrachloride U S P	2 000	misc

EXAMPLES OF SOLUBILITIES (*Continued*)

	Sol ble ın	
S bsta e	P ts f W t t 25 C	P rts f 95% Alco hol t 2 C
Mercury Bichloride U S P	13 5	3 8
Merphenyl Nitrate (Basic) N N R	vsl	sls
Mersalyl U S P	1	3
Methenamine U S P	1 5	12 5
Methyl Salicylate U S P	sls	misc
Morphine Sulfate U S P	15 5	565
Neoarsphenamine U S P	vs	sl
Neocinchophen U S P	pri	sol
Neostigmine Bromine U S P	1	sol
Nicotinamide U S P	1	1 5
Nicotinic Acid U S P	fs	fs
Nitric Acid U S P	misc	
Nitrous Oxide U S P	sol	fs
Oil of Chenopodium N F		8†
Oil of Cinnamon U S P		2†
Oil of Clove U S P		2†
Oil of Peppermint U S P		4†
Oleovitamin D Synthetic U S P		sls
Ouab ın U S P	slow s	slow s
Oxygen U S P	32	7
Pancreatin U S P	part s	ins
Paraldehyde U S P	8	misc
Pelletierine Tannate U S P	250	sol
Pentobarbital Sodium U S P	vs	fs
Petrolatum U S P	ins	pri
Petrolatum Liquid U S P	ins	ins
Phenacaine Hydrochloride U S P	50	fs
Phenobarb tal U S P	1 000	8
Phenobarbital Sod um U S P	vs	sol
Phenol U S P	15	vs
Phenolphthale n U S P	pri	13
Phenyl Sal cylate N F	6 670	6
Physostigm ne Sal cyl te U S P	75	16
Picrotoxin U S P	350	3
P'locarp ne Hydrochloride N F	0 3	3
Pilocarp ne N trate U S P	4	75
P e Tar U S P	sl	misc

Hot alcohol
† 0% lcohol
‡ Bo l ng alcohol

EXAMPLES OF SOLUBILITIES (*Continued*)

Substance	Solubility	
	Parts of Water at 25 C	Parts of 95% Alcohol at 25 C
Estradiol Benzoate U S P	pri	sol
Estriol N N R	pri	sol
Estrone U S P	pri	sol
Ether U S P	12	misc
Ethyl Aminobenzoate U S P	vsl	5
Ethyl Chaulmoograte N F	ins	misc
Ethyl Chloride U S P	sls	fs
Ethyl Oxide U S P	12	misc
Ethylene U S P	9	0 5
Ethylmorphine Hydrochloride U S P	8	25
Eucalyptol U S P		misc
Eucatropine Hydrochloride U S P	vs	fs
Ferrous Sulfate U S P	1 4	ins
Formaldehyde Solution of U S P	misc	misc
Glycerin U S P	misc	misc
Halibut Liver Oil U S P	vs	f
Hexobarbital Soluble N N R	vs	fs
Histamine Phosphate U S P	4	
Homatropine Hydrobromide U S P	6	40
Hydrochloric Acid U S P	misc	
Iodine U S P	2 950	12 5
Iodochlorohydroxyquinoline N F	pri	sps
Iodophthalein Sodium U S P	7	sls
Iron and Ammonium Citrates U S P	vs	in
Lactose U S P	4 9	vsl
Lead Acetate U S P	1 6	30
Lime N F	840	ins
Magnesium Carbonate U S P	pri	in
Magnesium Oxide U S P	pri	in
Magnesium Sulfate U S P	0 8	sps
Mecholyl Chloride N N R	fs	f
Menadione U S P	pri	60
Menthol U S P	1	f
Mercuric Oxide Yellow U S P	pri	in
Mercuric Salicylate N F	pri	pri
Mercuric Succinimide N F	20	sls
Mercurous Chloride Mild U S P	ins	ins
Mercury Ammoniated U S P	ins	ins

EXAMPLES OF SOLUBILITIES (*Continued*)

S bst	Sol ble	
	P t f W t t 25 C	P t f 95% Alco- h l t 25 C
Sodium Perborate U S P	40	
Sodium Phosphate U S P	4	vsl
Sodium Salicylate U S P	0 9	9 2
Sodium Sulfate U S P	1 5	ins
Starch U S P	in	ins
Strophanthin U S P	sol	sol
Strychnine Sulfate U S P	35	81
Sucrose U S P	0 5	170
Sulfadiazine U S P	sps	sps
Sulfanilamide U S P	125	37
Sulfapyridine N F	100	300
Sulfapyridine Sodium Sterile N F	1 25	sol
Sulfarsphenamine U S P	vs	sls
Sulfathiazole U S P	vsl	sls
Sulfobromophthalein Sodium U S P	sol	ins
Sulfur Precipitated U S P	pn	pn
Sulfur Sublimed U S P	pn	pn
Tannic Acid U S P	vs	vs
Theobroma Oil U S P		sls
Theobromine and Sodium Acetate U S P	1 5	sls
Theophylline U S P	120	80
Theophylline and Sodium Acetate U S P	25	ins
Thiamine Hydrochloride U S P	1	100
Thymol U S P	1 000	1
Thymol Iodide U S P	ins	sl
Thyroxin U S P	ins	ins
Totaquine U S P	pn	
Tribromoethanol U S P	35	
Tryparsamide U S P	2	sls
Turpentine Rectified Oil of N F		5
Urea U S P	*1 5*	*10*
Vitamin D N N R	ins	sol
Wool Fat Hydrous U S P	ins	
Zinc Acetate U S P	2 3	30
Zinc Chloride U S P	0 25	1 3
Zinc Oxide U S P	ins	ins
Zinc Sulfate U S P	0 6	ins

Diluted alcohol

EXAMPLES OF SOLUBILITIES (*Continued*)

	Soluble in	
Substance	Parts of Water at 25° C	Parts of 95% Alcohol at 25° C
Pituitary Posterior U S P	parts	
Potassium Acetate U S P	0 5	2 9
Potassium Bicarbonate U S P	2 8	prt
Potassium Bitartrate N F	162	8 820
Potassium Bromide U S P	1 5	250
Potassium Carbonate U S P	0 9	ins
Potassium Citrate U S P	1	prt
Potassium Iodide U S P	0 7	22
Potassium Permanganate U S P	14 2	dec
Potassium Sodium Tartrate U S P	0 [illegible]	prt
Procaine Hydrochloride U S P	0 6	30
Protein Silver Mild U S P	fs	prt
Protein Silver Strong N F	fs	prt
Quinacrine Hydrochloride U S P	35	sol
Quinidine Sulfate U S P	*90*	*10*
Quinine Bisulfate U S P	9	23
Quinine Dihydrochloride U S P	0 6	12
Quinine Hydrochloride U S P	*16*	*1*
Quinine Sulfate U S P	810	120
Quinine and Urea Hydrochloride N F	0 9	2 4
Resorcinol U S P	0 9	0 9
Riboflavin U S P	vsl	prt
Saccharin U S P	290	31
Saccharin Sodium U S P	1 5	50
Salicylic Acid U S P	*460*	*2 7*
Scopolamine Hydrobromide U S P	1 5	20
Shark Liver Oil N N R	ins	sls
Silver Nitrate U S P	0 4	30
Soap Hard U S P	sol	sol
Soap Medicinal Soft U S P	*sol*	*sol*
Sodium Bicarbonate U S P	10	ins
Sodium Biphosphate U S P	fs	prt
Sodium Borate U S P	*16*	*ins*
Sodium Bromide U S P	1 1	16
Sodium Carbonate Monohydrated U S P	3	ins
Sodium Chloride U S P	2 8	sls
Sodium Iodide U S P	0 55	2
Sodium Nitrite U S P	1 5	sps

6 *Current Literatu e* Phys cians should read the medical periodical of high standard systematically and adopt only those therapeutic measures that are based on sound and adequate observations The reputation of the journal publi hing the article as well as that of the institution where the studies were performed may aid in estimating the value of the observations

On the following pages will be found those items which have been included in the fourteenth edition of Useful Drugs

Acetarsone N F

USES Amebiasis trichomonas vaginitis and sarcoid

DOSAGE Orally 0 25 Gm 2 to 3 doses per day for even days for amebiasis Locally in trichomonas vaginalis as a 12 5 per cent powder

Acetophenetidin (Acetphen) U S P

USES Analgesic antipyretic

DOSAGE 0 3 Gm Begin with 0 2 Gm and repeat cautiously

Acetylsalicylic Acid (Acid Acetylsal) U S P

USES Antipyretic analgesic antirheumatic

DOSAGE 0 3 Gm In rheumatic fever 0 5 to 1 Gm every two to three hours watch for symptoms of salicylism

Adrenal Cortex Extract N N R

USES Treatment of Addison s disease and other adrenal insufficiencies

DOSAGE 100 to 500 dog units daily may be suffi cient in Addison s disease For severe crises as much as 2 00 to 5 000 dog units within a few hours Supplement with sodium chloride and diet low in potassium

Alcohol U S P

USES Rubefacient astringent refrigerant anti septic stimulant diaphoretic vehicle

Part IV

MATERIA MEDICA—USEFUL DRUGS

The number of drugs alleged to be beneficial in disease is great the number with established effectiveness s not so large

Regular consultation of the following publications will aid considerably in acquiring a rational knowledge of materia medica

1 *United States Pharmacopeia* Official publication containing descriptions of the physical qualities methods of preparation standardization and dosage of a large number of drugs It is inadvisable to use all the preparation recommended in this text It should be used rather as a ource of specific information

2 *National Formulary* Official publication largely devoted to pharmaceutical preparation Its scope is such as to include many preparations which are worthless and irrational

3 *Useful Drugs* A mall volume prepared under the direction of the Council on Pharmacy and Chemistry of the American Medical Association It d scribe the action and application of drug that have stablished therapeutic value It includes a select number of preparations from the large number in the U S Pharmacopeia the National Formulary and New and Nonofficial Remedies

4 *New and Nonofficial Remedies* This publication contains a description of the preparation application nd dosage of new and reliable proprietary preparations accepted by the Council on Pharmacy and Chemistry of the American Medical Association The preparation de cribed in this text as a rule are not included in the U S Pharmacopeia Th book is of considerable aid in guiding physician to new therapeutic discoveries and away from the numerous usele s or harmful pat nt medicine In applying preparations from the N N R it i strongly recommended that one familiarize himself with th composition method of preparation and dosage de cribed there n

5 *A Standard Text Book of Pharmacology* Such a text hould always be on the shelf above the desk It contain the ba ic facts that underlie the rational application of drug

Amphetamine N N R

USES As amphetamine sulfate N N R, in the treatment of narcolepsy and in mild depressive states

DOSAGE 2 5 to 10 mg

Amyl Nitrite (Amyl Nitris) U S P

USES Vasodilator

DOSAGE 0 2 cc by inhalation

Anhydrohydroxyprogesterone U S P

USES Induce secretory changes in endometrium and stimulate mammary alveolar tissue

DOSAGE 10 mg

Antimony and Potassium Tartrate (Antimon et Pot Tart) U S P

USES Acute laryngitis and bronchitis schistosomiasis leishmaniasis and granuloma inguinale

DOSAGE Expectorant *3 mg* Bilharzia infections etc 0 04 Gm in 1 per cent isotonic solution of sodium chloride intravenously

Antimony Sodium Thioglycollate U S P

USES Schistosomiasis leishmaniasis and granuloma inguinale

DOSAGE 50 mg From 0 05 to 0 1 Gm in 10 to 20 cc sterile water every third or fourth day until 15 to 25 injections have been given

Apomorphine Hydrochloride (Apomorph Hydrochlor) U S P

USES *Emetic*

DOSAGE 5 mg Beware of promiscuous repetition

Arsenic Trioxide (Arsen Trioxid) U S P

USES Externally mild caustic internally in leukemia and anemias

Aluminum Hydroxide Gel (Gel Alum Hy drox) U S P

USES Gastric antacid

DOSAGE 8 cc

Aluminum Phosphate Gel U S P

USES *Gastric* antacid

DOSAGE 8 cc

Amino Acid Preparations N N R

Preparations (usually mixtures) of amino acids or their precursors derived either synthetically or by artificial digestion (acid or enzymatic hydrolysis) *from various sources of proteins*

USES As a readily utilized source of dietary nitrogen in the management of protein deficiency Orally *administered preparations may be a useful adjunct* in the treatment of peptic ulcer

DOSAGE Based on needs of patient *An adequate protein intake for adults is about 1 Gm kg of body* weight per day

Ammoniated Mercury (Hydrarg Ammon) U S P

Ammoniated mercury is chiefly used in the form *of the ointment*

AMMONIATED MERCURY OINTMENT (*UNG HYDRARG* AMMON) U S P

USES Antiseptic local stimulant

DOSAGE 2 to 10 per cent

Ammonium Chloride (Ammon Chlorid) U S P

USES Expectorant diuretic and to render urine acid

DOSAGE Expectorant 0 3 Gm repeated every two hours Diuretic 3 to 6 Gm daily

Benzalkonium Chloride U S P
USES Antiseptic
DOSAGE Locally as 1 1000 solution for superficial injuries 1 5000 to 1 10 000 for widely denuded surfaces

Benzedrine Sulfate N N R. (See Amphetamine)

Benzoin (Benzoin) U S P
USES Compound Tincture of Benzoin is used as stimulant and protective for ulcers etc for inflamed respiratory mucous membranes and as an expectorant

Benzyl Benzoate U S P
USES Scabies
DOSAGE Apply locally as aqueous emulsion containing 25 to 50 per cent benzyl benzoate

Bismuth and Potassium Tartrate (Bism et Pot Tart) U S P
USES Antisyphilitic
DOSAGE By parenteral injection 0 15 Gm at intervals of seven days until 2 4 to 3 0 Gm have been injected

Bismuth Subcarbonate (Bism Subcarb) U S P
USES As other insoluble salts of bismuth antacid
DOSAGE Antacid 1 Gm

Butyl Aminobenzoate (Butyl Aminobenz) U S P
USES Local anesthetic
DOSAGE Dusting powder or in oil solutions

Caffeine (Caff) U S P
USES Stimulant
DOSAGE 0 2 Gm

DOSAGE General tonic 1 to 2 mg As Solution of Arsenious Acid and Solution of Potassium Arsen ite, initial dose may be 0 2 cc three times daily

Ascorbic Acid (Acid Ascorb) U S P

USES Ascorbic acid deficiency

DOSAGE 50 mg

Aspidium, U S P

USES As Oleoresin of Aspidium, teniacide

DOSAGE *Caution!* Single daily dose 4 Gm pro portioned to strength and health of patient after alimentary canal has been emptied Follow in three hours by a saline laxative

Atropine (Atrop) U S P

USES As Atropine Sulfate antispasmodic anti sialogogue

DOSAGE Atropine Sulfate 0 5 mg or less For pylorospasm of infants 0 05 mg to 0 1 mg hypo dermically or in feedings

Barbital (Barbital) U S P

USES Sedative hypnotic and anticonvulsant

DOSAGE 0 3 Gm Dose varies according to in tended use

Barbital Sodium (Barbital Sod) U S P

USES Same as Barbital but more soluble

DOSAGE 0 3 Gm

Barium Sulfate U S P

USES *In roentgenology*

DOSAGE For stomach and intestines 60 Gm For colon 500 Gm of mucilage of acacia 1½ Kg of condensed milk and 250 Gm of barium sulfate injected into the rectum from a height of from 3 to 6 feet, examination being made at same time by fluoroscope

Castor Oil (Ol Ricin) U S P
USES Cathartic demulcent lubricant
DOSAGE 15 cc

Charcoal
Activated Charcoal (Carbo Activat) U S P
USES Deodorant absorbent
DOSAGE 1 Gm

Chenopodium
Oil of Chenopodium (Ol Chenopod) U S P
USES Anthelmintic for ascarides and hookworm
DOSAGE Up to 1 cc for adults *Caution!*

Chiniofon (Chiniofon) U S P
USES Treatment of amebiasis
DOSAGE 1 Gm Orally 0 25 to 1 0 Gm thrice daily rectally 1 to 5 Gm freshly dissolved in 200 cc of water Children according to age

Chloral Hydrate (Chloral Hydr) U S P
USES Hypnotic sedative
DOSAGE 0 6 Gm freely diluted

Chloroazodin (Chloroazodin) U S P
USES External disinfectant
DOSAGE As freshly prepared solution or Solution of Chloroazodin 1 3 300 or 1 1 600 aqueous solutions for dressings 1 2 000 in olive oil for mucous membranes

Chorionic Gonadotropin N N R
USES Cryptorchidism
DOSAGE 200 to 500 international units two to three times a week

Cinnamon
Oil of Cinnamon (Ol Cinnam) U S P
USES Aromatic carminative
DOSAGE 0 1 cc As Cinnamon Water 15 cc

Calcium Gluconate (Calc Glucon) U S P

USES To overcome calcium deficiency anti spasmodic

DOSAGE Oral 5 Gm Intravenous, 1 Gm

Calcium Phosphate

Tribasic Calcium Phosphate (Calc Phos Tribas) U S P

USES Antacid calcium deficiency

DOSAGE 1 Gm

Carbarsone (Carbarson) U S P

USES Treatment of intestinal amebiasis

DOSAGE *Orally for adults* 0 2 Gm *twice daily* for ten days Children reduce according to weight Retention enemas for adults 2 Gm in 200 cc of 2 per cent sodium bicarbonate solution

Carbon Dioxide (Carbon Diox) U S P

USES Respiratory stimulant

DOSAGE Up to 7 per cent added to oxygen *Beware of overdose*

Carbon Tetrachloride (Carb Tetrachlorid) U S P

USES *Vermifuge*

DOSAGE Beware of poisoning Adults 1 cc Children 0 06 cc for each year of age up to 15 years Do not repeat within three weeks avoid oils fats and alcohol

Cardamom Seed (Cardam Sem) U S P

USES Aromatic carminative stomachic

DOSAGE *4 cc of the Compound Tincture of Cardamom*

Cascara Sagrada (Casc Sagr) U S P

USES Laxative

DOSAGE Aromatic Fluidextract 2 cc repeated as necessary Tablets 0 3 Gm Extract 0 3 Gm and Fluidextract 1 cc

Cyclopropane (Cycloprop) U S P
USES General anesthesia

Desoxycorticosterone Acetate U S P
USES Addison s disease and other adrenal cortical insufficiencies
DOSAGE 1 to 5 mg intramuscularly

Dextrose (Dextros) U S P
USES Source of food

Dichlorophenarsine Hydrochloride U S P
USES Syphilis
DOSAGE 45 mg intramuscularly

Diethylstilbestrol U S P
USES Same as estrogenic substances
DOSAGE 0 2 to 5 mg

Diethylstilbestrol Dipropionate N N R
USES Same as estrogenic substances
DOSAGE 0 5 to 5 mg

Digitalis (Digit) U S P
USES Cardiac tonic indirect diuretic
DOSAGE Powdered Digitalis 0 1 Gm Capsules Tablets and Tincture see Useful Drugs

Digitoxin U S P
USES Similar to digitalis
DOSAGE The full therapeutic effects are induced in a patient who has not had digitalis during the previous three weeks by the oral administration of a total of 1 2 mg of digitoxin given in fractional doses The usual initial dose is 0 6 to 1 0 mg with sufficient doses of 0 4 mg down to 0 2 mg on the same day The total daily maintenance dose is from 0 1 to 0 2 mg Patients may be digitalized by starting with total daily doses of 0 2 mg such doses usually induce the full therapeutic effects in about one week The great potency of digitoxin requires a careful

Clove

Oil of Clove (Ol Caryoph) U S P

USES Antiseptic aromatic carminative counter irritant, anodyne

Cod Liver Oil (Ol Morrh) U S P

USES Prevention and treatment of rickets and to insure adequate vitamin A intake

DOSAGE Prophylactic 8 cc daily Emulsion of Cod Liver Oil 15 cc Cod Liver Oil Concentrate in Oil 6 to 12 drops or more or two tablets daily

/ **Codeine (Codein) U S P**

USES Analgesic hypnotic sedative

DOSAGE Codeine Phosphate and Codeine Sulfate 30 mg

Colchicum Seed (Colch Sem) U S P

USES Occasionally used in gout

DOSAGE Colchicine 0 5 mg Tincture of Colchicum Seed 2 cc

Collodion (Collod) U S P

USES Protective vehicle

Cresol U S P

USES Germicide

DOSAGE In solutions 1/4 to 1 per cent As Saponated Solution of Cresol 1 to 5 per cent

Crotalus Antitoxin (North American Anti Snake Bite Serum) N N R

USES Treatment of Crotalus family snake bite

DOSAGE *50 cc or more intramuscularly* or subcutaneously occasionally intravenously Supplement with first aid measures

Cupric Sulfate (Cupr Sulf) U S P

USES Astringent caustic germicide and fungicide

DOSAGE Collyria 1 part in 1000 to 1 in 100

Diphtheria Toxin Diagnostic (Toxin Diphtheric Diagnost) U S P
USES Schick test
DOSAGE Intracutaneously 0 1 cc

Diphtheria Toxoid (Toxoid Diphtheric) U S P
USES To produce an active immunity to diphtheria
DOSAGE 1 cc subcutaneously Repeat in 30 days and again if necessary

Diphtheria Toxoid Alum Precipitated U S P
USES Active immunization against diphtheria
DOSAGE 1 cc subcutaneously repeated in not less than one month

Emetine Hydrochloride (Emet Hydrochlor) U S P
USES Emetic amebacide
DOSAGE Intramuscular 60 mg Avoid in children

Ephedrine (Ephedrin) U S P
USES Vasoconstrictor bronchial antispasmodic and against urticaria
DOSAGE 20 to 50 mg Locally 1 per cent in oil As a spray 0 5 to 2 per cent solution of a salt As Ephedrine Hydrochloride or Ephedrine Sulfate 25 mg

Epinephrine (Epineph) U S P
USES Vasoconstrictor bronchial antispasmodic and against anaphylaxis
DOSAGE Epinephrine Hydrochloride 0 5 to 1 mg subcutaneously or intramuscularly

Ergonovine Maleate (Ergonov Mal) U S P
USES To cause uterine contraction
DOSAGE 0 5 mg

observance of the proper technic of its adminis tration

Digoxin, U S P

USES Same as digitalis

DOSAGE Initial dose of 0 75 to 1 5 mg followed by doses of 0 25 to 0 75 mg at six hour intervals Daily maintenance dose is 0 25 to 0 75 mg

Diphenhydramine Hydrochloride, N N R

USES Antiallergic in urticaria angioneurotic edema vasomotor rhinitis drug sensitization hay fever serum reactions and similar conditions

DOSAGE 50 mg three or four times daily

Diphenylhydantoin Sodium (Diphenylhydant Sod) U S P

USES Anticonvulsant

DOSAGE 0 1 Gm

Diphtheria Antitoxin (Antitox Diph) U S P

USES Curative and prophylactic agent in diphtheria

DOSAGE Therapeutic 5 000 to 40 000 units parenterally depending on symptoms prophylactic 1 000 units Beware of hypersensitivity to horse serum

Diphtheria and Tetanus Toxoids U S P

USES Active immunization against diphtheria and tetanus

DOSAGE Three doses of 1 cc each at intervals of approximately three weeks

Diphtheria and Tetanus Toxoids Alum Precipitated U S P

USES Active immunization against diphtheria and tetanus

DOSAGE Two doses of 1 cc each at intervals of four to six weeks

Ethinyl Estradiol N N R
USES For estrogen therapy
DOSAGE 0 05 to 0 15 mg orally

Ethyl Aminobenzoate (Aethyl Aminobenz) U S P
USES Local anesthetic for topical use
DOSAGE Dusting power pure or diluted Oint ment 5 per cent

Ethyl Chaulmoograte N F
USES Sarcoidosis
DOSAGE 2 cc orally 1 cc intramuscularly in creasing to maximum of 3 to 5 cc weekly

Ethyl Chloride (Aethyl Chlor) U S P
USES Local anesthesia

Ethylene (Aethylen) U S P
USES General anesthetic

Ethylmorphine Hydrochloride (Aethylmorph Hydrochlor) U S P
USES To create local vasodilatation and acute conjunctival edema in eye Used in conjunctivitis corneal ulcer acute glaucoma etc
DOSAGE Externally 5 to 10 per cent aqueous solution sometimes used in powder and ointment form

Ethylstibamine N N R
USES Leishmaniasis
DOSAGE Infants 0 05 to 0 1 Gm Children 2 to 4 years 0 05 to 0 2 Gm Children 5 to 9 years 0 1 to 0 25 Gm Children 10 to 15 years 0 2 to 0 3 Gm Adults 0 2 to 0 3 Gm from 8 to 10 in jections as a 5 per cent solution intravenously or as a 25 per cent solution intramuscularly administered daily or every other day

Ergotamine Tartrate (Ergotam Tart) U S P
USES Relief of migraine
DOSAGE 0 25 mg subcutaneously Orally 1 mg

Erythrityl Tetranitrate —*Used in the form of* ERYTHRITYL TETRANITRATE TABLETS (TAB ERYTHRIT TETRANIT) *U S P*
USES Vasodilator
DOSAGE 30 mg Repeat *every 4 to 6 hours*

Estradiol U S P
USES For estrogen therapy
DOSAGE 0 1 mg to 1 0 mg orally

Estradiol Benzoate (Estradiol Benz) U S P
USES For estrogen therapy
DOSAGE 1 mg parenterally

Estriol N N R
USES *For estrogen therapy*
DOSAGE Orally 0 06 to 0 12 mg one to four times daily

Estrogenic Substances (Water Insoluble), N N R
USES For estrogen therapy
DOSAGE *2000 to 20 000 international units parenterally*

Estrogenic Substances (Water *Soluble*) N N R
USES For estrogen therapy
DOSAGE 1 25 to 3 75 mg orally

Estrone (Estron) U S P
USES For estrogen therapy
DOSAGE Intramuscularly up to 1 mg (10 000 I U) Suppositories for children 0 02 to 0 2 mg (200 to 2 000 I U)

Ether U S P
USES General anesthesia

Hexobarbital Soluble N N R

USES Intravenous anesthesia

DOSAGE 2 to 4 cc of a 10 per cent solution at a rate of 1 cc per ten seconds intravenously

Homatropine Hydrobromide (Homatrop Hydrobrom) U S P

USES Mydriatic

DOSAGE 2 per cent aqueous solution as drops of 1 in 500 solution

Homatropine Methylbromide N F

USES Gastrointestinal antispasmodic

DOSAGE 2 5 mg

Hydrochloric Acid (Acid Hydrochlor) U S P

USES Diluted Hydrochloric Acid for gastric acid insufficiency intestinal putrefaction

DOSAGE Diluted acid 2 cc in half a glass of water

Hydrogen Peroxide

SOLUTION OF HYDROGEN PEROXIDE (LIQ HYDROG PEROX) U S P

USES Germicide cleansing agent

Insulin Injection, U S P

USES Lowers blood sugar and restores temporarily to the body the ability to oxidize carbohydrate which results in glycogen being stored in the liver and thus furnishes satisfactory treatment in diabetes mellitus

DOSAGE It is administered subcutaneously in the arm thigh or buttocks one two or three times a day usually 30 minutes before meals The determination of adequate dosage is made by estimations of the blood sugar at intervals following its initial administration The modified form (Protamine Zinc Insulin U S P and Globin Insulin with Zinc N N R) is used as may be indicated

Eucatropine Hydrochloride (Eucatrop Hydrochlor) U S P

USES Mydriatic

DOSAGE 2 to 3 drops of from a 5 to 10 per cent solution

Ferrous Sulfate (Ferr Sulf) U S P

USES Hematinic

DOSAGE 0 3 Gm

Formaldehyde

SOLUTION OF FORMALDEHYDE (LIQ FORMALDEHYD) U S P

USES Germicide

DOSAGE 1 to 2 per cent

Glycerin (Glycerin) U S P

USES Solvent sweetening agent protective An evacuant in the form of Glycerin Suppositories

Glyceryl Trinitrate —Used in the form of SPIRIT OF GLYCERYL TRINITRATE (SP GLYCERYL TRINITRAT) U S P

USES Vasodilator

DOSAGE 0 06 cc on the tongue repeated as needed Tablet 0 4 mg under the tongue

Glycyrrhiza (Glycyrrh) U S P

USES Vehicle flavoring agent

DOSAGE Fluidextract 2 cc

Halibut Liver Oil (Ol Hippoglos) U S P

USES To provide vitamin A

DOSAGE 0 1 cc for severe vitamin deficiencies 20 drops Halibut Liver Oil Capsules one capsule Halibut Liver Oil with Vitamin D Concentrate in Vegetable Oil one or two capsules daily Halibut Liver Oil with Viosterol for infants 0 2 cc for adults increase up to 0 45 cc

Magnesium Oxide (Mag Oxid) U S P
USES Antacid laxative antidote to corrosive acids
DOSAGE Antacid 0 25 Gm Laxative 4 Gm

Magnesium Sulfate (Mag Sulf) U S P
USES Cathartic central nervous system depressant
DOSAGE Cathartic 15 Gm Depressant 0 6 cc intramuscularly of a 25 per cent solution for each kilogram of body weight six times daily

Mandelic Acid (Acid Mandel) U S P
USES Urinary tract bactericide
DOSAGE 3 Gm four times daily

Measles Serum

Human Immune Globulin (Glob Immun Human) U S P
USES To prevent or modify an attack of measles
DOSAGE Prevention 2 to 10 cc modification 2 to 5 cc

Human Measles Immune Serum (Ser Immun Morbill Human) U S P
USES To prevent or modify an expected attack of measles
DOSAGE 10 to 20 cc parenterally

Menadione (Menadion) U S P
USES Prothrombin deficiencies vitamin K deficiencies obstructive jaundice hemorrhagic state associated with primary hepatic disease and intestinal diseases and treatment of hypoprothrombinemia of the newborn
DOSAGE 1 mg maximum dose 2 mg per day

Menadione Sodium Bisulfite U S P
USES Same as menadione

Iodine (Iod) U S P

USES Antiseptic caustic, thyroid disorder

DOSAGE Strong Solution (Lugol's) 0 3 *to* 0 5 cc *one to three times daily* Tincture for external use

Iodophthalein Sodium (Iodophthal Sod) U S P

USES Roentgenologic examination of the gall bladder

DOSAGE For each 10 kilograms of body weight Oral 0 5 Gm Intravenous 0 3 Gm

Iron and Ammonium Citrates (Ferr et Ammon Cit) U S P

USES Hematinic

DOSAGE 1 Gm

Lactose (Lactos) U S P

USES Diluent food

Lard

Benzoinated Lard (Adeps Benz) U S P

USES *Ingredient of ointments*

Lime N F

USES Disinfectant

Liver

USES Extract of Liver Liver Injection Solution of Liver pernicious anemia

DOSAGE 1 U S P unit

Magnesium Citrate

SOLUTION OF MAGNESIUM CITRATE (Liq Mag Cit) U S P

USES Purgative

DOSAGE 200 cc

DOSAGE Orally 0 2 to 0 5 Gm subcutaneously 0 01 Gm *to test patient's tolerance If tolerated* increase cautiously to 0 025 Gm In paroxysmal auricular tachycardia from 0 02 to 0 04 Gm By ion transfer a 0 2 to 0 5 per cent (1 500 to 1 200) *solution in distilled water* The latter method should be employed only by those specially trained

Methenamine (Methenam) U S P

USES Urinary tract antiseptic

DOSAGE 0 5 Gm in water every four hours

Methyl Testosterone U S P

USES Same as testosterone

DOSAGE Oral 10 mg sublingual 5 mg

Mild Mercurous Chloride (Hydrarg Chlorid Mit) U S P

USES Laxative stimulant for ulcers

DOSAGE 0 12 Gm

Morphine Sulfate (Morph Sulf) U S P

USES Analgesic hypnotic

DOSAGE 10 mg

Mustard

Black Mustard (Sinap Nig) U S P

USES Counterirritant emetic

DOSAGE Emetic *10 Gm in 250 to 500 cc of* warm water

Naphazoline Hydrochloride N N R

USES Nasal vasoconstrictor

DOSAGE Use as 0 05 or 0 1 per cent solution locally

Neoarsphenamine (Neoarsphen) U S P

USES Same as arsphenamine

DOSAGE *Caution—Solutions of neoarsphenamine must be freshly prepared when required for use The solution should not be shaken* —U S P *Caution*

DOSAGE 2 mg, intravenously and intramuscularly

Menthol, U S P

USES Counterirritant antipruritic stimulant

DOSAGE Ointment or oily solution 0 5 to 1 per cent

Meperidine Hydrochloride N N R

USES Analgesic

DOSAGE 0 1 Gm orally or intramuscularly

Meralluride Sodium Solution N N R

USES Diuretic

DOSAGE 1 to 2 cc

Mercurophylline

MERCUROPHYLLINE INJECTION (INJ MERCUROPHYLL) U S P

USES Diuretic

DOSAGE 1 cc parenterally

Mersalyl and Theophylline

MERSALYL AND THEOPHYLLINE INJECTION (INJ MERSAL ET THEOPHYLL) U S P

USES Diuretic

DOSAGE Intramuscularly Mersalyl 0 2 Gm and Theophylline 0 1 Gm

Mestilbol N N R

USES For estrogen therapy

DOSAGE 0 5 to 5 0 mg orally

Methacholine Chloride U S P

ACETYL BETA METHYLCHOLINE CHLORIDE U S P

USES In selected cases of paroxysmal auricular tachycardia for palliative local treatment of chronic rheumatoid (atrophic) arthritis chronic ulcers Raynaud s disease scleroderma and certain other vasospastic conditions of the extremities

CONCENTRATED OLEOVITAMIN A AND D (OLEO VITAM A ET D CONC) U S P
USES Same as cod liver oil
DOSAGE Prophylactic infants and adults 0 1 cc Concentrated Oleovitamin A and D Capsules one capsule

Ouabain (Ouabain) U S P
USES Essentially that of strophanthin
DOSAGE Intravenous 0 25 mg

Ox Bile U S P
USES Extract of Ox Bile to combat bile in sufficiency
DOSAGE 0 3 Gm

Oxophenarsine Hydrochloride U S P
USES Antisyphilitic
DOSAGE 45 mg intravenously

Oxygen (Oxygen) U S P
USES Alone for difficult or deficient respiration and mixed with carbon dioxide to stimulate respira tion and produce hyperventilation

Paraldehyde (Paraldehyd) U S P
USES Hypnotic antispasmodic
DOSAGE 4 cc

Parathyroid
PARATHYROID INJECTION (INJ PARATHYROID) U S P
USES Parathyroid insufficiency
DOSAGE Intramuscular 25 U S P units

Pelletierine Tannate (Pellet Tann) U S P
USES Anthelmintic and teniafuge
DOSAGE 0 25 Gm Children 0 1 Gm

Penicillin U S P
USES Anti infective against gram positive or ganisms such as streptococci staphylococci and

Intravenou 0 45 Gm Cold sterile distilled water should be used in dissolving the drug (2 cc of water to 0 1 Gm of drug) and the injections should be made at once since neoarsphenamine oxidizes rapidly and becomes toxic The duration of the injection should be not less than five minutes

Neocinchophen (Neocinchophen) U S P

USES Analgesic in gout and certain arthriti conditions

DOSAGE 0 3 Gm thrice daily with water

Neostigmine

Neostigmine Bromide (Neostig Bromid) U S P

USES Myasthenia gravis

DOSAGE Oral 15 mg

Neostigmine Methylsulfate, U S P

USES Myasthenia gravis

DOSAGE 0 5 mg subcutaneously or intramuscularly

Nicotinamide (Nicotinamid) U S P

USES Those of nicotinic acid

DOSAGE 25 mg

Nicotinic Acid (Acid Nicotin) U S P

USES Nutritional factor of vitamin B complex human pellagra

DOSAGE 25 mg or more

Nitrous Oxide (Oxid Nitros) U S P

USES General anesthesia

Oleovitamin A (Oleovitam A) U S P

USES Same as cod liver oil

DOSAGE Prophylactic infants and adults 0 1 cc Oleovitamin A Capsules one capsule

DOSAGE Total of 6 cc in four doses twelve to fourteen days apart

Pertussis Vaccine Combined with Diphtheria and Tetanus Toxoids N N R

USES Simultaneous immunization against whooping cough diphtheria and tetanus

DOSAGE Three doses of 1 cc each at three to four week intervals

Pertussis Vaccine Combined with Diphtheria Toxoid N N R

USES Simultaneous immunization against whooping cough and diphtheria

DOSAGE Three doses of 1 cc each at three to four week intervals

Petrolatum (Petrolat) U S P

USES White Petrolatum ointment base lubricant Emulsion of Liquid Petrolatum laxative Liquid Petrolatum vehicle for local use evacuant

DOSAGE Emulsion of Liquid Petrolatum 30 cc Liquid Petrolatum 15 cc

Phenacaine Hydrochloride (Phenacain Hydrochlor) U S P

USES Local anesthetic

DOSAGE Eye 5 minims of a 1 per cent solution

Phenobarbital (Phenobarb) U S P

USES Hypnotic and sedative

DOSAGE From 0 015 to 0 1 Gm increased if necessary to not more than 0 6 Gm The average dose is 0 1 Gm A maximum dose of 0 6 Gm should not be exceeded

Phenobarbital Sodium (Phenobarb Sod) U S P

USES Same as Phenobarbital except may be used intravenously in emergencies

pneumococci and against meningococci, gonococci and syphilis

DOSAGE May be given as sodium potassium or calcium salt or as potassium or calcium salt suspended in beeswax and oil Dose depends on severity of infection Usual dose is 20,000 to 50 000 units as aqueous solution intramuscularly every three hours Oil and wax preparations may be given as single do e of 300 000 units once or twice daily

Pentobarbital Sodium (Pentobarb Sod) U S P

USES Essentially those of barbital sodium

DOSAGE Orally as hypnotic 0 1 Gm, as pre anesthetic sedative 0 2 Gm Rectally for analgesia for infants up to 1 year 0 03 Gm up to 3 years 0 06 Gm for adults from 0 3 to 0 4 Gm dissolved in a few cubic centimeters of water

Caution Aqueous solutions of pentobarbital sodium decompose on standing when boiled precipitation occurs and ammonia is evolved —N N R

Pertussis Immune Serum (Human) N N R

USES Passive immunity in prophylaxis in exposed individuals or in treatment of whooping cough

DOSAGE Depends on titer of serum Follow manufacturer s recommendations

Pertussis Vaccine N N R

USES Active immunization against whooping cough

DOSAGE Not less than the equivalent of 15 billion organisms per dose and a total dose of at least 45 billion organisms

Pertussis Vaccine and Antitoxin Combined N N R.

USES Active immunization against whooping cough

Pituitary Posterior

Posterior Pituitary (Pituitar Post) U S P

USES As powder to control diabetes insipidus As injection uterine stimulant

DOSAGE 1 cc subcutaneously intramuscularly or intranasally in uterine inertia begin with 0 2 cc repeated at intervals of 30 to 50 minutes if necessary

Plasma Human

Citrated Normal Human Plasma (Plas Human Nor Citr) U S P

USES Blood substitute

DOSAGE 500 cc intravenously

Potassium Bromide (Pot Brom) U S P

USES Sedative

DOSAGE 1 Gm

Potassium Iodide (Pot Iodid) U S P

USES Antiluetic (gumma) expectorant promotes elimination of mercury and lead

DOSAGE 0 3 Gm Antiluetic 2 Gm

Potassium Sodium Tartrate (Pot et Sod Tart) U S P

USES Cathartic

DOSAGE 10 Gm Compound Effervescent Powders (sodium bicarbonate potassium and sodium tartrate and tartaric acid) contents of a white and blue paper in 60 cc of water

Procaine Hydrochloride (Procain Hydrochlor) U S P

USES Local anesthetic

DOSAGE For infiltration anesthesia solutions of 0 25 Gm in 100 or 50 cc of isotonic solution of sodium chloride with 5 or 10 drops of epinephrine solution (1 in 1 000) When a large volume of the solution is used for infiltration the concentration of

DOSAGE Orally, 30 mg parenterally used as 20 per cent solution

Phenol U S P

USES Anesthetic antiseptic germicide

DOSAGE Bacteriostatic agent *1* in *800* solution Germicide *1* per cent Earache *3* to *5* per cent solution of phenol in glycerin Ointments 1 per cent

Phenolphthalein (Phenolphthal) U S P

USES Purgative

DOSAGE *60 mg*

Physostigmine Salicylate (Physostig Salicyl) U S P

Caution—Physostigmine Salicylate is extremely poisonous'—U S P

USES Stimulates parasympathetic nerves and intestinal peristalsis used in myasthenia gravis, reduces intraocular tension in glaucoma

DOSAGE *2 mg* Eye 0 1 to 1 per cent solution

Picrotoxin (Picrotox) U S P

USES Treatment of barbiturate poisoning

DOSAGE 2 mg or more intramuscularly or intravenously

Pilocarpine Hydrochloride (Pilocarpin Hydrochlor) N F

USES Stimulates parasympathetic nerves diaphoretic relieves itching miotic

DOSAGE Up to 5 mg Beware of use in pulmonary disease

Pilocarpine Nitrate (Pilocarpin Nitras) U S P

USES See *Pilocarpine Hydrochloride*

DOSAGE Up to 5 mg Smaller doses may be preferable

DOSAGE Oral Adults 0 1 Gm three times daily for five days Children of 1 to 4 years 0 05 Gm twice daily Children of 4 to 8 years 0 1 Gm twice daily Prophylactic Adults 0 2 Gm twice weekly or 0 05 Gm daily Children 0 05 Gm every other day

Quinidine Sulfate (Quinidin Sulf) U S P
USES Auricular fibrillation antimalarial
DOSAGE 0 2 Gm four times daily

Quinine Bisulfate (Quin Bisulf) U S P
USES That of quinine
DOSAGE Oral 1 Gm daily

Quinine Dihydrochloride (Quin Dihydro chlor) U S P
USES That of quinine
DOSAGE 1 Gm daily tonic 0 1 Gm

Quinine Hydrochloride (Quin Hydrochlor) U S P
USES That of quinine
DOSAGE Oral 0 2 Gm

Quinine Hydrochloride and Ethyl Carbamate
QUININE HYDROCHLORIDE AND ETHYL CARBAMATE INJECTION (INJ QUIN HYDROCHLOR ET AETHYL CARB) U S P
USES Sclerosing agent
DOSAGE 0 5 cc to 1 cc of solution containing 13 per cent (W/V) quinine hydrochloride and 6 5 per cent (W/V) ethyl carbamate

Quinine Sulfate (Quin Sulf) U S P
USES That of quinine
DOSAGE 0 6 Gm

Rabies Vaccine (Vac Rabies) U S P
USES To develop immunity against rabies before or after bite from infected animal

epinephrine hydrochloride should not exceed one part in 250 000 parts of the solution and a total of more than 1 milligram of epinephrine should not be injected at one dose For instillations and injections solutions of 0 1 Gm in 10 or 15 cc isotonic solution of sodium chloride with or without 10 drops of epinephrine solution (1 in 1 000) in ophthalmology 1 to 5 per cent or even up to 10 per cent solution in rhinolaryngology from 5 to 20 per cent solutions are recommended with the addition of from 6 to 8 drops of epinephrine solution (1 in 1 000) to each 12 cc

Progesterone U S P
USES Habitual abortion
DOSAGE 5 to 50 mg intramuscularly

Propyl Thiouracil N N R
USES Thyrotoxicosis hyperthyroidism and thyroiditis
DOSAGE 150 mg daily by mouth in divided doses until B M R is in normal range then 50 to 100 mg daily depending on response of patient

Protein Silver

Mild Silver Protein (Arg Prot Mit) U S P
USES Antiseptic
DOSAGE 10 to 25 per cent solutions freshly prepared

Strong Protein Silver (Arg Prot Fort) U S P
USES Antiseptic
DOSAGE 0 25 to 1 per cent solutions for instillations or injections in 1 in 1 000 to 1 in 2 000 solutions as irrigations

Quinacrine Hydrochloride (Quinacrin Hydrochlor) U S P
USES Antimalarial

Scopolamine Hydrobromide (Scopol Hydro brom) U S P
USES Sedative mydriatic
DOSAGE 0 5 mg

Senna (Senn) U S P
USES Purgative
DOSAGE 2 Gm Fluidextract of Senna 2 cc Syrup of Senna 8 cc

Serum Human

Normal Human Serum (Ser Human Nor) U S P
USES Blood substitute
DOSAGE Intravenous 500 cc

Shark Liver Oil N N R
USES For vitamin A content
DOSAGE One capsule or about 0 52 cc daily

Silver Nitrate (Arg Nitras) U S P
USES Antiseptic astringent caustic
DOSAGE Conjunctivitis 4 per cent followed by solution of sodium chloride Prevention of gonorrheal conjunctivitis one drop of 2 per cent solution Pharynx 2 to 10 per cent Urethra 1 in 10 000 to 1 in 2 000

Smallpox Vaccine (Vac Var) U S P
USES Vaccination against smallpox

Soap
USES Camphor and Soap Liniment stimulant rubefacient vehicle Medicinal Soft Soap detergent vehicle

Sodium Bicarbonate (Sod Bicarb) U S P
USES Antacid render urine alkaline alkaline wash antipruritic
DOSAGE 2 Gm Intravenously 5 per cent freshly prepared

DOSAGE Depending on type of vaccine 0 5 to 3 cc for seven to twenty eight days Site and severity of infection should influence treatment

Resorcinol (Resorcin) U S P

USES Antiseptic astringent to produce exfoliation of the epidermis

DOSAGE Externally 1 to 3 per cent up to 5 to 10 per cent

Riboflavin (Riboflav) U S P

USES Riboflavin deficiency

DOSAGE Adults 5 mg for infants approximately 1 mg per day

Rose

Cabbage Rose (Rosa Centifolia) —Used in pharmacy chiefly in the form of the water

ROSE WATER (AQ Ros) U S P

USES Flavoring agent

Saccharin (Saccharin) U S P

USES Saccharin Sodium sweetening agent

DOSAGE 30 mg

Salicylic Acid (Acid Salicyl) U S P

USES Antiseptic stimulant

DOSAGE Astingent 1 to 2 per cent alcoholic solution or ointment Antiseptic antiparasitic keratolytic 2 to 5 per cent dusting powder or ointment

Scarlet Fever Streptococcus Toxin (Toxin Scarlat Streptococ) U S P

USES To determine susceptibility to scarlet fever infection and for active immunization

DOSAGE For immunity test 0 1 cc intracutaneously, for active immunization 3 to 5 doses at intervals of a week

Starch U S P

USES Dusting and drying powder diluent emollient, protective cataplasm antidote to iodine poisoning

Stibamine Glucoside N N R

USES Leishmaniasis

DOSAGE 0 1 Gm per 100 lbs body weight intravenously Give on alternate days for a total dose of not more than 3 Gm per 100 lbs body weight

Stibophen N F

USES Granuloma inguinale and schistosomiasis

DOSAGE 0 2 Gm intramuscularly

Stomach

Powdered Stomach (Stomach Pulv) U S P

USES Pernicious anemia

DOSAGE 1 U S P unit

Streptomycin N N R

USES Anti infective Useful against gram negative organisms such as Hemophilus influenzae Pasteurella tularensis Escherichia coli Pseudomonas aeruginosa Bacillus proteus and Mycobacterium tuberculosis

DOSAGE In severe infections 2 to 3 Gm daily in six divided doses intramuscularly In the presence of meningitis 0 1 Gm may be given intraspinally In tuberculosis 1 0 Gm daily divided into two doses twelve hours apart

Strophanthin (Strophanthin) U S P

USES Essentially that of digitalis

DOSAGE Intramuscular or intravenous 0 5 mg

Succinchlorimide N F

USES Disinfection of drinking water

DOSAGE 11 6 mg per liter of water

Sodium Biphosphate (Sod Biphos) U S P
USES Increase urine acidity
DOSAGE 0 6 Gm

Sodium Bromide (Sod Bromid) U S P
USES Sedative
DOSAGE 1 Gm

Sodium Chloride (Sod Chlorid) U S P
USES Emetic laxative Isotonic Solution of Sodium Chloride and Three Chlorides, Lactate Ringer s Solution replace tissue fluids, electrolytes and minerals

Sodium Iodide (Sod Iodid) U S P
USES That of potassium iodide goiter prophylaxis
DOSAGE 0 3 Gm Antisyphilitic 2 Gm Preparation of toxic goiter patients for operation 0 15 Gm

Sodium r Lactate Injection, U S P
USES Treatment of acidosis and alkalizing the urine
DOSAGE Subcutaneously or intravenously By latter route no more than 300 cc per hour (approximately 60 drops per minute)

Sodium Nitrite (Sod Nitris) U S P
USES Vasodilator
DOSAGE 60 mg

Sodium Phosphate (Sod Phos) U S P
USES Cathartic
DOSAGE 4 Gm Effervescent Sodium Phosphate 10 Gm

Sodium Salicylate (Sod Salicyl) U S P
USES Analgesic antipyretic
DOSAGE 0 3 Gm Combine with alkali and dilute with water

sterile distilled water In severe staphylococcic meningococcic or hemolytic streptococcus the initial dose should be 0 10 Gm per kilogram of body weight If oral route cannot be substituted subsequent doses are based on 0 03 to 0 05 Gm of the drug per kilogram of body weight intravenously at 12 to 15 hour intervals

Sulfaguanidine U S P

USES For bacteriostatic and bactericidal influence on intestinal organisms bacillary dysentery

DOSAGE Initial dose in bacillary dysentery 0 05 Gm per kilogram maintenance dose 0 05 Gm per kilogram every 4 hours until the number of stools is five or less daily then every 8 hours for at least 3 days For prophylaxis prior to operation 0 05 per kilogram every 8 hours for 5 days and nights before the operation then continue as soon as possible same dosage for 7 days after operation

Sulfamerazine U S P

USES Anti infective

DOSAGE In serious infections 3 to 4 Gm initially by mouth followed by 1 0 Gm every eight hours until temperature has been normal for 72 hours

Sulfanilamide (Sulfanilamid) U S P

USES Anti infective

DOSAGE In serious infection an initial oral dose of 0 1 Gm per kilogram followed by one sixth of this amount at four hour intervals until temperature has been normal for 72 hours at which time dose is gradually decreased May be given subcutaneously as a 1 per cent solution preferably in one sixth molar sodium racemic lactate solution

Sulfapyrazine N N R

USES Anti infective

DOSAGE 2 to 4 Gm initially and 1 0 Gm every four to six hours thereafter

Succinylsulfathiazole, U S P

USES Preoperative preparation for surgery on bowel and in acute bacillary dysentery

DOSAGE Preoperative 0 25 Gm per kg of body weight orally at four hour intervals

Sucrose (Sucros) U S P

USES Vehicle

Sulfadiazine U S P

USES Anti infective in pneumococcic pneumonia hemolytic streptococcic meningococcic, Fried lander s bacillus staphylococcic gonococcic, etc , infections

DOSAGE Initial dose for adults 0 10 Gm per kilogram of body weight Subsequent doses for pneumococcic infections 1 Gm every 4 hours until temperature has been normal for 72 hours severe streptococcic staphylococcic and meningococcic in *fections 1 0 to 1 5 Gm until temperature* has been normal for from 5 to 7 days In children initial oral dose is 0 10 to 0 15 Gm per kilogram of body weight and subsequent doses should be 1/4 of the initial dose given at intervals of 6 hours until the temperature has been normal for at least 48 hours In mild or moderate hemolytic streptococcus infec tions an initial oral dose of 0 05 Gm per kilogram of body weight followed by a total daily dose based on 0 10 Gm per kilogram of body weight this to be di vided into 6 doses and given every 4 hours day and night by mouth until the temperature has been normal for 3 to 5 days In mild or moderately severe strep tococcic infections concentrations of the drug in the blood of 5 to 10 mg per hundred cubic centimeters are usually satisfactory

Sulfadiazine Sodium patients severely ill with pneumonia initial dose is 0 075 Gm per kilogram of body weight made up in a 5 per cent solution in

Synthetic Oleovitamin D (Oleovitam D Synth) U S P
USES Prophylaxis and treatment of rickets and infantile tetany
DOSAGE 0 1 cc up to 0 3 to 0 4 cc

Testosterone Propionate U S P
USES Replacement therapy in castrates or eunuchoidism
DOSAGE 5 to 25 mg intramuscularly

Tetanus Antitoxin (Antitox Tet) U S P
USES For prevention and treatment of tetanus
DOSAGE Prophylactic 1 500 units subcutaneously therapeutic 20 000 units intramuscularly or intravenously

Tetanus Toxoid (Tox Tet) U S P
USES Production of active immunity to tetanus
DOSAGE 3 doses of 1 cc each injected subcutaneously or intramuscularly at intervals of three weeks

Tetanus Toxoid Alum Precipitated U S P
USES Production of active immunity to tetanus
DOSAGE May be given in two subcutaneous injections of 0 5 cc or 1 cc at intervals of three to four months

Theobromine and Sodium Acetate (Theobrom et Sod Acet) U S P
USES Diuretic
DOSAGE 0 5 Gm

Theophylline Ethylenediamine (Theophyll Aethylenediam) U S P
USES Diuretic edemas bronchial asthma etc
DOSAGE Orally 0 2 Gm rectally 0 36 Gm as Theophylline Ethylenediamine Injection intramuscularly or intravenously 0 1 Gm

Sulfathiazole (Sulfathiazol) U S P

USES Anti infective

DOSAGE In the treatment of pneumococcic pneumonia in adults the initial dose of sulfathiazole should be 4 Gm to be followed by 1 Gm every 4 hours day and night until the patient s temperature has been normal for 72 hours The drug should then be discontinued *In children ill with pneu*mococcic pneumonia the initial dose should be based on 0 15 Gm per kilogram (up to 25 Kg of body weight) and the total daily dose is calculated on the same basis The total daily dose should be divided into four equal parts and administered at 6 hour intervals until the temperature has been normal for 36 hours The drug should then be stopped From 4 to 6 mg per 100 cc of blood is the desirable concentration although in acute infections concentrations of 7 to 10 mg per 100 cc may be sought

Sulfathiazole Sodium initial dose for patients severely ill with pneumonia is 0 06 Gm per kilogram of body weight

Sulfobromophthalein Sodium (Sulfobromophthal Sod) U S P

USES Liver function test

DOSAGE 2 mg per kilo of body weight

Sulfur

USES Precipitated Sulfur Sublimed Sulfur Sulfur Ointment Purgative parasiticide seborrheal conditions fumigation

Suramin Sodium U S P

USES Trypanosomiasis

DOSAGE 1 0 Gm intravenously at weekly intervals *fo* a total of 5 to 10 Gm

the dose should not exceed 0 04 to 0 05 Gm per kilogram of body weight It may be administered intramuscularly never orally It is dissolved in sterile water or in sterile isotonic solution of sodium chloride for injection

Tuberculin

Old Tuberculin (Tuberculin Prist) U S P

USES Diagnosis of tuberculosis

DOSAGE Intracutaneously 0 1 cc (0 01 mg) of old tuberculin

Purified Protein Derivative of Tuberculin N N R

USES Mantoux skin test

DOSAGE 0 00002 mg and 0 005 mg intracutaneously

Typhoid Vaccine

Bacterial Vaccine made from the Typhoid Bacillus (Vac Typhos) U S P

USES To develop immunity against typhoid infections

DOSAGE 0 5 cc and 1 cc by hypodermic injection 7 to 10 days after the first injection the latter dose to be repeated in 7 to 10 days

Typhoid and Paratyphoid Vaccine U S P

USES Prevention of typhoid fever and paratyphoid fevers A and B

DOSAGE 0 5 cc and 1 cc repeat latter dose once

Tyrothricin N N R

USES Anti infective

DOSAGE Locally as a solution containing 500 micrograms per cc

Vinyl Ether U S P

USES General anesthetic

Thiamine Hydrochloride (Thiamin Hydrochlor) U S P

USES Beriberi and wherever thiamine hydrochloride deficiency may exist

DOSAGE 5 mg

Thyroid (Thyroid) U S P

USES Thyroid deficiency

DOSAGE 60 mg

Totaquine (Totaquin) U S P

USES Antimalarial

DOSAGE 0 6 Gm

Tribromoethanol (Tribromoeth) U S P

USES Basal anesthesia

DOSAGE Rectal for each kilogram of body weight 60 mg Total amount should not exceed 8 Gm for women or 10 Gm for men

SOLUTION OF TRIBROMOETHANOL (LIQ TRIBROMOETH) U S P

USES Basal anesthesia

DOSAGE For each kilogram of body weight rectal 0 06 cc It should be kept in mind that the amylene hydrate adds materially to the narcotic effects of tribromoethanol Total amount should not exceed 8 cc for women or 10 cc for men regardless of weight

Trimethadione N N R

USES Petit mal epilepsy

DOSAGE 1 to 2 Gm daily in divided doses of 0 3 Gm

Tryparsamide (Tryparsam) U S P

USES Against trypanosomiasis syphilis

DOSAGE *Caution* Intravenous 2 Gm The dose commonly used varies from 1 to 3 Gm dependent on the purpose for which it is used In general

Part V

ACUTE POISONING DIAGNOSIS AND TREATMENT

The fate of the patient is often determined within the first few minutes after poison has been taken (aconite strychnine mercuric chloride) hence one should be prepared to take the necessary steps promptly—that is without the unnecessary loss of one minute Many of the antidotes commonly recommended involve delay in their preparation (potassium permanganate dissolves slowly) and it is better to employ measures which involve no delay and follow these with others if necessary

There is prevalent an erroneous belief that corrosives weaken the walls of the stomach after which vomiting may cause rupture of the stomach Vomiting does not cause tension of the stomach walls and rupture is not to be expected

The following general principles should be kept in mind but it is even more important to remember that there are no fixed rules for the treatment of poisoning every patient requires careful individual consideration or the treatment may be more dangerous than the poison The following measures are suggestive and are to be followed in each case only where there is no contraindication to such a procedure

A Remove the poison from the body promptly
 (1) by gastric lavage
 (2) by emesis (apomorphine hydrochloride intramuscularly)

Vitamin D, N N R

USES Treatment and prevention of rickets
DOSAGE 2 drops Curative dose, 15 to 20 drops

Wool Fat

Hydrous Wool Fat (Adeps Lan) U S P
USES Ointment base

Yellow Fever Vaccine U S P
USES Active immunization against yellow fever
DOSAGE 0 5 cc subcutaneously

Yellow Mercuric Oxide (Hydrarg Oxid Flav) U S P
USES Antiseptic stimulant
DOSAGE Ointment 0 1 to 1 per cent

Zinc Peroxide, Medicinal U S P
USES Antiseptic and astringent
DOSAGE As 40 per cent aqueous suspension locally

Zinc Sulfate (Zinc Sulf) U S P
USES Astringent styptic and internally as an emetic
DOSAGE 1 Gm In collyria 0 1 to 1 per cent

ACETANILID ANTIPYRINE ACETOPHENETIDIN AMINOPYRINE

Symptoms Vomiting (sometimes) Face cyanosed Skin cold profuse sweat sometimes rash simulating measles scarlatina or pemphigus Collapse feeble and irregular pulse slow respiration

Antidote and Treatment Gastric lavage or emetic External heat stimulants recumbent position caffeine carbon dioxide oxygen inhalation if not available oxygen inhalation if needed

ACONITE

Symptoms Tingling and numbness of tongue and mouth and sense of formication of the body Nausea and vomiting diarrhea with epigastric pain Dyspnea Pulse irregular and weak Skin cold and clammy features bloodless Giddiness staggering walk feeling of heaviness The mind remains clear

Antidote and Treatment Avoid emetics Gastric lavage (with 0 1 per cent [1 1 000] potassium permanganate 250 cc if its use does not involve delay) Reflex stimulants ether alcohol (whisky) aromatic spirits of ammonia Caffeine Carbon dioxide oxygen inhalation if necessary External heat recumbent position with head lower than feet

ALCOHOL (ETHYL ALCOHOL)

Symptoms Ataxia cramps coma decreased respiration Abolition of the superficial and deep reflexes

Antidote and Treatment Gastric lavage Coffee enema Administration of carbon dioxide-oxygen inhalation External heat aromatic spirits of ammonia caffeine artificial respiration

(3) by purgation in the case of slowly absorb able poisons and those which have passed into the duodenum

B Destroy the poison remaining in the body

(1) neutralize acids by weak alkali (precipitated chalk lime water)

(2) oxidize with potassium permanganate solu tion of little value except for morphine and a few other poisons

C Delay absorption into the circulation

(1) by precipitation of insoluble compound (tannin)

(2) by adsorption by charcoal

(3) starch paste for iodine

D Antagonize action by another drug

(1) depress a stimulated structure (physostig mine by atropine)

(2) stimulation of depressed central nervous sys tem (caffeine after morphine)

(3) rest for depressed central nervous system 5 to 10 per cent CO in O by respiration or (artificial respiration when the center is de pressed)

E Elimination by excretion (seldom of much value in acute poisoning)

(1) diuretics after certain alkaloids

Brief outlines of diagnosis and treatment of acute illnesses due to some of the common poisons follow Several other fairly common poisons ha e not been in cluded because there are no special measures which are useful The suggestions outlined above should be followed unless specifically contraindicated It is recommended that interns learn the technic of treating those cases which are likely to arise in their districts dependent on peculiarities of manufacture in certain areas

painful diarrhea thirst sense of constriction in throat rendering swallowing difficult, cyanosis coma

Antidote and Treatment Abundant gastric lavage with warm water followed by the oral administration of 500 cc of 10 per cent solution of magnesium sulfate 2 3 Dimercaptopropanol in Oil (BAL) 3 mg per kilogram of body weight intramuscularly every four hours Sodium thiosulfate 0 3 Gm dissolved in 20 to 30 cc of distilled water for injection Orally 1 Gm in capsules Infusion of solution of sodium chloride containing sodium bicarbonate (5 per cent) if necessary Milk diet Treat as potential nephritic patient

ATROPINE BELLADONNA HYOSCYAMINE SCOPOLAMINE STRAMONIUM

(Asthma Remedies)

Symptoms Dryness of mouth Difficulty in deglutition and articulation thirst Skin flushed Temperature raised Pulse quick Pupils widely dilated Purging Delirium

Antidote and Treatment Evacuation of the stomach If time is available, purified animal charcoal as antidote (2 tablespoonfuls in 250 cc of water) Caffeine Catheterization if necessary If excitation persists barbital or paraldehyde Physostigmine prostigmine

BARBITURATES

(Insomnia and Sedative Remedies)

Symptoms Coma circulatory collapse pulmonary edema moist skin cyanosis sometimes delirium twitching and increased reflexes

Antidote and Treatment Cover patient warmly recumbent position Gastric lavage Picrotoxin

ALKALIS (FIXED) AND CAUSTIC SODIUM AND POTASSIUM HYDROXIDE (LYE) SODIUM CARBONATE (WASHING SODA)

Symptoms Burning difficulty in swallowing sloughed tissues vomiting blood and tissues collapse convulsions unconsciousness or coma

Antidote and Treatment Use vinegar, diluted acetic acid orange or lemon juice to neutralize and later demulcents such as white of egg or olive oil to protect irritated mucous membranes

AMMONIA

Symptoms Gastrointestinal symptoms as in corrosive poisoning Purging usual with pain and straining Body cold with cold sweat Countenance anxious Pulse rapid and weak

Antidote and Treatment Neutralization with 0 5 per cent hydrochloric acid A large volume of weak acid until washings by stomach tube no longer have odor of ammonia 250 cc of olive oil by mouth Large quantities of water

ANESTHETICS VOLATILE (CHLOROFORM CYCLOPROPANE ETHER ETHYLENE NITROUS OXIDE)

Symptoms Rapid heart rate Abolition of reflexes stoppage of heart or respiration

Antidote and Treatment Withdrawal of anesthetic If respiration stoppage occurs artificial respiration carbon dioxide oxygen caffeine given intravenously or intramuscularly if circulatory collapse persists epinephrine intravenously 1 100 000 slowly or intracardially 1 10 000

ARSENIC AND ANTIMONY COMPOUNDS

(Paris Green Sprays Weed Killers)

Symptoms Symptoms usually appear in from a quarter of an hour to one hour Vomiting profuse

of a solution containing 1 per cent of methylene blue and 1 8 per cent of anhydrous sodium sulfate repeat the injection if necessary until a total of 200 cc has been injected Frequently consciousness and the reflexes are restored before the first injection is completed If the patient lapses into unconscious ness or shows respiratory depression the injection should be repeated Then as quickly as possible proceed with gastric lavage with a 5 per cent solu tion of sodium thiosulfate or two tablespoonful of hydrogen peroxide (3 per cent household variety) in order to oxidize any poison which remains in the stomach Perform artificial respiration or use oxygen carbon dioxide by inhalation during cyanosis and inject 0 5 Gm of caffeine with sodium benzoate intramuscularly

Alternative Treatment Inject intravenously — very slowly — 10 cc portions of 1 per cent solution of sodium nitrite until a total of 50 cc has been injected in about an hour If improvement is shown while the prognosis remains unfavorable the injec tion of the solution may be continued cautiously but it must be stopped at once in case of sudden collapse

Epinephrine should be at hand to combat nitrite shock should that occur Supplement the nitrite treatment by the intravenous injection of 20 cc of a freshly prepared 5 per cent filtered solution of sodium thiosulfate at once and if necessary con tinue this injection until a total of 500 cc of the solution of sodium thiosulfate has been injected if possible The remainder of the treatment is the same as that outlined above

It is advantageous to have the solutions sterilized by boiling for 15 minutes but treatment should not be delayed for that purpose

1 1000 intravenously Caffeine ephedrine Car bon dioxide oxygen inhalation

CHLORAL HYDRATE

Symptoms Vomiting collapse, delirium, fall of temperature cyanosis dyspnea or slow respirations Coma

Antidote and Treatment Lavage Guard against chilling Caffeine Inhalation of carbon dioxide oxygen or artificial respiration as needed

COCAINE AND OTHER LOCAL ANESTHETICS

Symptoms Anxiety, fainting pallor dyspnea brief convulsions and apnea With smaller doses confusion laughter vertigo motor excitement tachycardia irregular respiration pallor dilated pupils and exophthalmos paresthesia delirium and dyspnea *Death may occur in a few minutes*

Antidote and Treatment If taken by mouth evacuation followed by tannic acid (5 Gm) orally If injected absorption should be checked by liga tion and effects counteracted by the intravenous injection of pentobarbital Artificial respiration if needed

CYANIDE (SODIUM OR POTASSIUM CYANIDE HYDROCYANIC ACID)

Symptoms Characteristic odor on breath (peach blossoms bitter almonds) also found in metal polish etching fluid Dyspnea cyanosis rapid pulse un consciousness tremors violent convulsions dilated pupils *Cyanosis may be absent during respiratory stimulation* If patient survives an hour recovery will probably follow but death may result after three or four hours

Treatment Inject intravenously at once 50 cc

FLUORIDES

(Insecticides Roach Powders)

Symptoms Burning cramp like abdominal pains grayish blue skin tremors convulsions collapse

Treatment Lavage with lime water several times Calcium gluconate 10 per cent intravenously artificial respiration demulcents Keep patient warm and quiet

FORMALDEHYDE

Symptoms Characteristic odor on breath Burning of mouth and throat Dysphagia Severe abdominal pain Unconsciousness and collapse Later diarrhea and tenesmus

Antidote and Treatment Swallow a tumblerful of 0 2 per cent ammonia Lavage with dilute ammonia (0 1 per cent) followed by raw egg in water and milk

GAS GARAGE GAS DEFECTIVE FLUE FUMES CARBON MONOXIDE

Symptoms Giddiness and singing in the ears Skin livid or cherry red Coma Loss of muscular power Pupils dilated Dyspnea Collapse

Antidote and Treatment Remove to fresh air immediately Inhalation of carbon dioxide and oxygen or artificial respiration if needed Bleeding followed by transfusion if indicated External heat Oxygen tent if available

GASOLINE AND KEROSENE

Symptoms Burning in mouth vomiting headache giddiness incoordination and in general symptoms which resemble drunkenness

Treatment Emetic of mustard and water Lav

Potassium permanganate decomposes sodium and potassium cyanide instantly in alkaline—not in acid—medium It also decomposes hydrocyanic acid instantly if it be made alkaline by the addition of sodium bicarbonate Treatment should be instituted promptly and it should not be delayed for the preparation of the solution of potassium permanganate

DIGITALIS

Symptoms Vomiting diarrhea Slow or very rapid pulse Cardiac rhythm regular or irregular Poor vision Prostration

Antidote and Treatment If poison is still in stomach evacuate by emetic or preferably gastric lavage with tannic acid or potassium permanganate 0 1 per cent if repeated vomiting has not already occurred Absolute quiet Symptomatic treatment Discussion Atropine sodium nitrite and quinidine can do no good and may do a great deal of mischief in the treament of digitalis poisoning In severe digitalis poisoning the blood pressure is apt to be lower than normal and the idea that localized vasoconstriction in the cerebral or coronary vessels may occur has no basis in fact The use of nitrite therefore in a patient in partial collapse as the result of severe digitalis poisoning can only make the patient s plight worse Atropine can abolish the harmless irregularities caused by digitalis but not the more serious ones and even to abolish those that are harmless doses of atropine are necessary which would add to the patient s distress Quinidine is distinctly dangerous in digitalis poisoning even though some abnormal rhythm induced by digitalis can be abolished by quinidine

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GASOLINE AND KEROSENE

Symptoms Burning in mouth vomiting headache giddiness incoordination and in general symptoms which resemble drunkenness

Treatment Emetic of mustard and water Lav

age with olive oil Black coffee as stimulant Artificial respiration if needed

HYDROCHLORIC NITRIC AND SULFURIC ACIDS

Symptoms Yellow to brown stains on lips and mouth Gastrointestinal symptoms coffee ground vomitus Purging usual with pain and straining Body cold with cold sweat Countenance anxious Pulse rapid and weak

Antidote and Treatment Milk of magnesia 100 to 400 cc or if not immediately available sodium bicarbonate solution or even water with stomach tube White of egg or olive oil as a demulcent external heat stimulants if necessary Caffeine hypodermically

IODINE

Symptoms Pain and heat in throat and stomach Vomiting and purging vomitus being yellow or blue if starchy matter is present in the stomach Stools may contain blood Intense thirst and metallic iodine taste Giddiness faintness and convulsions

Antidote and Treatment Sodium thiosulfate by mouth (1 to 10 Gm in water) as an antidote Then lavage with 1 per cent sodium thiosulfate Thick starch paste or flour soup External heat stimulants camphor oil caffeine hypodermically

LEAD AND ITS SALTS

Symptoms Sweetish metallic taste dry throat intense thirst Abdominal colic constipation dark feces Vomiting may occur Giddiness stupor convulsions coma

Antidote and Treatment Magnesium sulfate in solution as antidote Mucilaginous or egg albumin

drinks External heat Cathartic after lavage Calcium gluconate intramuscularly Morphine for colic

MERCURY AND ITS SALTS

Symptoms Metallic taste choking sensation Pain in stomach vomiting and purging of stringy mucus and blood Tongue may be white and shriveled Skin cold and clammy Pulse feeble and rapid

Antidote and Treatment Treatment in Emergency Room Evacuation of stomach at earliest moment possible by the intramuscular injection of apomorphine hydrochloride (0 008 Gm) or by stomach tube is imperative 2 3 Dimercaptopropanol in oil 3 mg per kilogram of body weight intramuscularly every four hours

Antidote (by mouth) Two raw eggs or one glass of milk or sodium thiosulfate (orally or intravenously) or sodium formaldehyde sulfoxylate followed by lavage with water

Treatment in the Ward Gastric lavage twice a day with 6 quarts of sodium bicarbonate solution Sodium citrate by mouth (amount to keep urine alkaline) Low pressure colonic irrigation twice a day with 6 liters of solution (8 Gm sodium citrate to 1 pint of water) Send urine vomitus and colonic washings to the laboratory daily for examination for mercury (500 cc of each) Daily specimens of urine to intern s laboratory Daily examination of the blood for nonprotein nitrogen Administration of stimulants and sedatives as indicated Treatment continued until symptoms have abated and mercury has disappeared from urine

MORPHINE CODEINE AND RELATED OPIUM ALKALOIDS

Symptoms Coma gradual in onset Symmetrical pinpoint pupils that dilate at death Respirations

slow and shallow Body cold cyanosis convulsions

Antidote and Treatment Gastric lavage with 1 000 cc of solution of potassium permanganate (1 1000) Potassium permanganate should be used before coffee is given (Useless in the presence of coffee or tea) Black coffee Keep the patient awake Carbon dioxide oxygen inhalation Artificial respiration if necessary External heat Caffeine hypodermically if respiration fails to improve

MUSHROOMS

Symptoms Colic vomiting purging Mental excitement followed by coma Extremities cold Pulse slow Respiration stertorous Pupils dilated Watch for late symptoms and have mushrooms identified as to variety

Antidote and Treatment Gastric lavage External heat If pulse is very slow atropine in fairly large doses 5 milligrams intramuscularly to paralyze the vagus endings In case of *Amanita muscaria* poisonings with *A phaloids* and *A verna* dextrose and calcium gluconate by vein

NICOTINE (INCLUDING TOBACCO)

Symptoms Severe depression with muscular weakness nausea and vomiting marked dyspnea weak rapid pulse pupils contracted early later dilated muscular tremors

Treatment Remove any poison from the stomach immediately by gastric lavage with 1 000 cc of 0 1 per cent solution (1 1 000) of potassium permanganate Follow with tannic acid and medicinal charcoal Inject 0 5 Gm of caffeine with sodium benzoate intramuscularly give strong coffee by mouth Apply heat externally Artificial respiration should be instituted at the first sign of respiratory failure

PHENOL COMPOUNDS

(Cresol and Disinfecting Solutions)

Symptoms Characteristic odor to breath White ish burns on lips and mouth pain in throat and stomach vomiting collapse and coma

Treatment Lavage with large amounts of warm water Give demulcents (white of egg milk—don t give oils) Caffeine artificial respiration if neces sary Keep patient warm and quiet

PHOSPHORUS

(Matches)

Symptoms Symptoms usually appear in three stages (1) a few hours after administration there develops a garlic taste gastrointestinal irritation, burning pain thirst swelling of the abdomen and vomiting of blood (green or black) The vomit has a garlic odor and in the dark may be phos phorescent The patient may die or there may be (2) an intermission of symptoms for three days or more with a feeling of malaise followed by (3) the final stage characterized by intense jaundice en larged liver and distended abdomen great prostra tion cold sweat and anxious look feeble pulse muscular twitching coma

Antidote and Treatment Gastric lavage with 5 to 10 liters of water or normal salt solution followed by 2 to 4 ounces of liquid petrolatum (to coat stom ach) and 500 cc of 10 per cent magnesium sulfate to remove any of the poison which has passed the pylorus No fats edible oils or milk should be given as they aid absorption External heat treatment continued for liver injury as well as intravenous in jection of dextrose and high carbohydrate diet dex trose and insulin

STRYCHNINE, NUX VOMICA

Symptoms Feeling of suffocation and lividity of the face Tetanic convulsions with short intermission causing sweating and exhaustion opisthotonos risus sardonicus staring eyes fixed chest and hard abdominal muscles Hearing and sight are acute and consciousness is retained The muscles of the jaw are not affected until late

Antidote and Treatment Early medicinal charcoal from 1 to 2 tablespoonfuls in a glass of water or 1 teaspoonful of tannic acid Gastric lavage with potassium permanganate (0 1 per cent solution) Later (with muscular hypertonicity) arrest hyper excitability or convulsion with inhalation anesthesia (ether or chloroform) and then inject soluble barbital 1 Gm (20 cc of 5 per cent) the first dose intravenously later by mouth or pentobarbital 6 mg per pound of body weight as the first dose and one half this amount for succeeding doses Do not use any measures that excite spasm Use ether alcohol Carbon dioxide oxygen inhalation if necessary

Part VI

DIET AND NUTRITION

When arranging special diets for various pathologic conditions, an attempt should be made to alter the normal diet only enough in physical character or chemical composition to meet the special requirements of the particular case. It should be emphasized that while dietary modifications are essential in the management of certain diseases, it is important, especially if a therapeutic diet is to be used for long periods of time, that the normal nutritional requirements of the body be met. The danger of serious vitamin and mineral deficiencies developing from long continued subsistence on one sided special diets and the role of infection in increasing the vitamin requirements are only now beginning to be generally recognized. Because normal requirements must always be considered in the construction of any special diet, these will be reviewed briefly.

A. REQUIREMENTS OF AN ADEQUATE DIET

PROTEIN

Amount. The minimum daily requirement of protein is from 0.5 to 0.6 Gm. per kilo for the adult and not less than 1.5 Gm. per kilo for children. With lower protein intakes nitrogen losses commonly occur. The standard allowance specified in table 2 provides for a 100 per cent margin of safety for

adults and for optimal growth and storage in children. Less than the minimum requirement should not be given except in certain acute illnesses. Such drastic reduction of protein intake should not be continued for longer than about three weeks and less if possible.

Kind. To provide adequate amounts of essential amino acids it has been considered that the normal adult diet should derive not less than one sixth and the normal child's diet not less than one third of the total protein from animal sources. *In low protein diets* special care should be taken to include adequate amounts of complete protein. Meat, eggs and milk supply complete proteins. The protein content of the average serving of a number of common foods will be found in table 3.

CALORIES

Supplied by protein, carbohydrate and fat.

Sources. Calories per gram of pure substance (physiologic values) are for fat 9, for protein 4, and for carbohydrate 4. Inspection of table 3 will show that in general foods highest in fat are richest in calories. Concentrated foods low in water content are also rich in calories, while foods containing very large proportions of water are necessarily low in calories.

Function of Fat in the Diet. (1) Increases palatability of food, (2) prevents premature hunger and (3) animal fats contained in whole milk, butter, cream, cheese, egg yolk and beef, pork and fish livers are important sources of vitamin A. Most fats contain a mixture of saturated and unsaturated fatty acid radicals. The significance of the unsaturated fatty acids for human nutrition is under study.

Relation of Carbohydrate to Normal Fat Metabolism. The quantity of fat which can be metabolized norm

ally is dependent upon the total available glucose of the diet the dextrose equivalence being computed as the carbohydrate plus 58 per cent of the protein plus 10 per cent of the fat Surprisingly little carbohydrate is needed however to prevent the development of ketosis in persons with normal carbohydrate metabolism It has been observed that if a diet contains 60 Gm of carbohydrate it is impossible to produce ketosis in the normal person by any amount of fat fed The ketogenic antiketogenic ratio appears to vary from time to time and it is frequently found that even 20 or 30 Gm of carbohydrate yields enough dextrose with that derived from the protein of the diet to prevent ketosis on diets containing from 200 to 250 Gm of fat In this connection it must be remembered that fat given in excess of

APPROXIMATE DISTRIBUTION OF PROTEIN FAT AND CARBOHYDRATE IN THE AVERAGE AMERICAN DIET

Protein	10–15%	75–100 Gm per 3000 calories
Carbohydrate	50–60%	300–500 Gm per 3000 calories
Fat	30–40%	100–150 Gm per 3000 calories

the total caloric requirement can only be deposited not burned and ketone bodies come only from fat that is metabolized On the other hand a higher dextrose fatty acid ratio is necessary for the anti ketogenic effect in children Most children will develop ketosis when the dextrose fatty acid ratio is 1 1 5

MINERALS

Calcium Phosphorus and Iron

Sources Information regarding food as a source of calcium phosphorus and iron is found in table 3 This table also presents evidence for the generally recognized fact that unless adequate amounts of milk

are included the customary American diet is almost certain to be deficient in calcium The standard allowance of calcium is assured by $1\frac{1}{2}$ to 2 pints of milk for children and 1 pint of milk for adults The milk may be taken as a beverage on cereals or cooked in foods and any form of milk, such as fresh pasteurized evaporated or dried may be used From $1\frac{1}{2}$ to 2 Gm of calcium are needed by pregnant and lactating women and approximately 15 milligrams of iron are needed in adolescence as well as in pregnancy and lactation The phosphorus requirement is usually met when the calcium and protein needs are supplied in the form of common foods

Iodine Inadequate supplies of iodine in food and drink may lead to the development of simple goiter As yet there is no agreement among investigators as to the actual daily iodine requirement but iodized salt containing one part of sodium or potassium iodide per 5 000 parts of salt (approximately 160 parts of iodine per million parts of salt) has been found to be an effective preventive of simple goiter in regions where the natural iodine content of the soil and water is deficient Rich food sources of iodine are sea foods in general particularly oysters haddock and canned salmon The iodine content of fruits and vegetables varies with the iodine content of the soil and of the water supply

VITAMINS

The recommended daily allowances for the various known essential vitamins given in table 2 are based on scientific evidence available in 1945 They represent not only the results of a critical appraisal of the evidence then available but the combined judgment of a considerable group of nutrition authorities representing various fields of nutrition research whose opinions were solicited by the Food

and Nutrition Board of the National Research Council The allowances are tentative and are subject to revision as more evidence concerning human nutritional requirements becomes available They represent intakes believed to support normal growth promote optimal nutrition and provide for a reasonable margin of safety Larger amounts of each of the vitamins are needed for the treatment of the well defined avitaminoses Larger amounts may also be needed in the treatment of other diseases particularly long continued fever and diseases of the gastrointestinal tract The estimated vitamin D requirements refer to infants children and to pregnant and lactating women only A special need for vitamin D in the food of adults in addition to that which is normally obtained in the diet and from direct irradiation of the skin with sunshine in most localities has not been demonstrated experimentally There are at present no adequate scientific data establishing the role of vitamin E or less well known vitamins of the vitamin B complex in human dietetics They are present in many common foods and are undoubtedly obtained in adequate quantities from diets which will furnish the requirements of the better known essentials

CRUDE FIBER

There is at present no generally recognized standard for the fiber content of the adequate diet Cowgill and Anderson have reported that normal men exhibit satisfactory laxation when their diet contains about 90 mg of fiber per kilogram of body weight daily or about 6 grams per day for an average sized man Individual tolerances vary widely and the fiber content of a given diet must be adjusted to meet this tolerance

WATER

The average normal fluid intake for adults is 3 0 to 3 5 quarts per day from all sources and for children 1 5 to 2 5 quarts per day from all sources A rough evaluation of the suitability of the fluid intake can be obtained by measuring the volume of the urine In the absence of renal or heart diseases or profuse sweating the normal fluid intake in adults is the amount that will produce from 1 000 to 2 000 cc of urine in 24 hours Because of their high water contents the following foods in addition to fruits and vegetables are counted as part of the fluid intake of an individual ice cream soup moulded gelatin desserts or salads water milk cream and other beverages

ACID BASE BALANCE

Acid forming diets are not a practical nutritional problem because a good mixed diet adequate in minerals and vitamins can scarcely be potentially acid A diet of meat and cereals omitting fruits vegetables and milk would be predominantly acid A diet high in fruits vegetables and milk supplies an excess of base forming elements and leads to the formation of a neutral or slightly alkaline urine For information concerning the acid base content of individual foods see bibliography at end of section

B SELECTION OF AN ADEQUATE DIET FOR ADULTS

For computation of the approximate composition of any given diet reference must be made to detailed tables of food composition such as the table on page

Adequate diets for childr n are similar in kind but different in quantity For a full discussion of children s requirements ee Infant Nutrition by Jeans and Marriott and other textbooks on nutrition and d etetics l ted in the b bl ography

134 of this outline or the more complete tables found in the government pamphlets and the texts on nutrition listed at the end of this section As a convenient generalization however it may be stated that a diet which meets the following dietary pattern will meet the standard allowances recommended by the Food and Nutrition Board of the National Research Council with the possible exception of small amounts of thiamine and riboflavin Milk 1 pt for adults $1^1/_2$ pts to 1 qt for children Egg 1 daily Meat 1 serving [20 gms at 1 year to 100 gms (3 5 ounces) for an adult] Vegetables 2 servings One green or yellow Fruit 2 servings One serving of citrus fruit or tomato and one other fruit as apple or prunes Potato one or more servings Butter or butter substitute with added vitamin A (1 to 5 large pats) Cereal and bread whole grain or enriched comprising at least half of the total cereal intake Sugar fat and other food to complete the calorie needs Complete data regarding the protein mineral and vitamin content of one such combination are presented in table 3 The most important sources of the various dietary essentials are indicated in heavy type It will be observed that the particular combination chosen may be considered to meet the standard allowance except for calories Additional calories are readily obtained from sugar and other sweets from fats used in the preparation of vegetables salad dressings and as an accompaniment to meats They are preferably obtained by larger servings of the foods indicated particularly meat bread butter and potatoes With larger servings of these foods additional phosphorus iron and vitamins A thiamine and riboflavin will also be supplied and the requirements for men of greater stature or of a higher degree of physical activity also may be met Without this expedient further increases in the vitamin and mineral content of the

RECOMMENDED DIETARY ALLOWANCES (AMOUNTS PER DAY) REVISED 1945[1]
(Food and Nutrition Board National Research Council)

	Calories	Protein grams	Calcium gram	Iron mg	Vitamin A I U	Thiamine mg	Riboflavin mg	Niacin (Nicotinic acid) mg	Ascorbic acid mg	Vitamin D I U
Man (154 lb 70 kg)										
Sedentary	2500	70	0 8	12	5000	1 2	1 6	12	75	
Moderately active	3000	70	0 8	12	5000	1 5	2 0	15	75	
Very active	4500	70	0 8	12	5000	2 0	2 6	20	75	
Woman (123 lb 56 kg)										
Sedentary	2100	60	0 8	12	5000	1 1	1 5	11	70	
Moderately active	2500	60	0 8	12	5000	1 2	1 6	12	70	*
Very active	3000	60	0 8	12	5000	1 5	2 0	15	70	*
Pregnancy (latter half)	2500*	85	1 5	15	6000	1 8	2 5	18	100	400 to 800
Lactation	3000	100	2 0	15	8000	2 0	3 0	20	150	400 to 800
Children up to 12 yrs										
Under 1 yr	100/2 2 lb (1 kg)	3 5/2 2 lb (1 kg)	1 0	6	1500	0 4	0 6	4	30	400 to 800
1 3 yrs (29 lb 13 kg)	1200	40	1 0	7	2000	0 6	0 9	6	35	400
4 6 yrs (42 lb 19 kg)	1600	50	1 0	8	2500	0 8	1 2	8	50	400
7 9 yrs (55 lb 25 kg)	2000	60	1 0	10	3500	1 0	1 5	10	60	400
10–12 yrs (75 lb 34 kg)	2500	70	1 2	12	4500	1 2	1 8	12	75	400
Children over 12 yrs										
Girls 13 15 yrs (108 lb 49 kg)	2600	80	1 3	15	5000	1 3	2 0	13	80	400
16–20 yrs (119 lb 54 kg)	2400	75	1 0	15	5000	1 2	1 8	12	80	400
Boys 13 15 yrs (103 lb 47 kg)	3200	85	1 4	15	5000	1 5	2 0	15	90	400
16–20 yrs (141 lb 64 kg)	3800	100	1 4	15	6000	1 8	2 5	18	100	400

T t t g l t w d h h t m pl g p t l d t b m t by g d d t th a ty f t l f d S h a d t w ll l p d th m l d t m th q m t f wh h l llk

Th ll d p d th l t m ts f t m A d t Th ll w f th t bl e b d th p m that pp m t ly tw th d f th t m A l f th g d t th try t b t d by t d th t c t e h s h lf l th h lf th l f t m A

I d lt (pt p g t d l t t g w m) g d t pply g 2 000 alo I h d g d t th ll f th m b fl d m y b 1 mg 1 5 mg d 10 mg esp t ly Th f t th t fig g fo d ff t cal l l f th m boil d d t ply th t w t m t th q m t f th f t th n 500 l b t th y dd d m ly f mpl t f l l t Oth m mb f th B mpl l q d th gh l s b g I d pply g d q t th m b fl d llt d t pply fh t f th m g B t m

Th d th t th m l d lt d l ttl Th ll w ll b p d d f th d t at f t y the p t

I p h h pp t ty f p u t l h d f ld ly p th g t f sm ll m ts f at m n D m y b d bl Oth d lt p b bly h l ttl d f t m D

D g th l tt pa t f p g y th ll w h ld pr m t ly 20 p t th p d g l l Th l f 2500 l p t th ll f p g t d t ry w m

All w f h ld b d the ds f the m ddl y h g p (5 8 t) a d a e f mode ate act ty a d f r g ght t th m ddl y f th age g p

d f f ts c f m m th t m th w th d t ty Th m ts g f pp m t ly 6 t 8 m th Th d t q m t f m f th t ts h p t d l m l f d d l g ly f m h m m lk

RECOMMENDED DIETARY ALLOWANCES (*Continued*)

Furth r recomm nd tion

J t Th a labl l tl nform t n g th huma equ m nt f fat F t ll wa mu t be based at pre ent mo e on food hab ts th phy l g al q m nt ll b l q r m nt f t tu ted f tty a l th lin l c and arachidon d f t al fat) has b mply d m t e d w th pe m tal num b b m n ed f these fatty d s n t k own In p te of th p ty of f m t th b; z th l fa t h h m k t des bl that f t be l d d n th d et to th te t f t l t 0 t 2 s t f th t t l l r d th t th f t t k l d es t al t ated fats d t the tent of t l t t pe t f th t t l l es At h g l l f al e pe d t f r ery a t pe so c m ng 4500 al r s a d f h ld d d le t p t des t l th t 30 t 35 per nt f th t t l lo es be d d f om f t S foodstuff su h as m t m lk h d tsm y b pe t d to t ib t bl f z z th t nt ff m n h lf to tw th l f th t tal m nts of f t mpl d ky th b p po t of th t t l al es t t fa to y t u p ated bl f t u h b tt m gar n t d a d h t g ly t th t nt f n th d t h lf f th am nt d t d

C pp Th r m t f pp f ad lts t t t t 2 mg d ly l ta t a d h ld req apr m tely 0 05 mg f r ch k l g m f bod w ght Th eq m nt f r ppe pp mat ly n t nth th t l A good d t n rm lly w ll supply suffic e t ppe

I d Th q m t f od e mall p b bly bout 0 002 to 0 004 mg da ly f h k l g m f body we ght o a t t l of 0 15 t 0 30 g d ly f th ad lt Th s d s m t by th g a u f d d ft t e pec ally mpo t t n ad l wre a d p g

Ph ph A t bl de nd t th t th ph ph ll w es h ld be e l a t ju l to thos fo l m n the d ets f h ld d f w m d e th l tt p t f p g d lu g la tat n l th f th d lt th p l sph allow n es h ld be pp m t l 1 5 t m tho f m l g l t fet m th t 5 th l i m a d p t e l at m t thr gh mm f f th h ph u q em t l ll be ed b a th mmo food l t l uma l p t n l th be t c f pho ph

V t m K Th qu m t f tam K ll t f d by a s good d t Spe l d t n d t b g n t n wborn f t Phy m ly g t m k the t th m th bef d l ry t th f nt mm d l ly ft r l th

S l Th d f s lt d f wat l ly t l t l All l ll wa f ul m slo l f th d lt 5 g m d ly pt f m pe wh w t p f ely Th g m l e k f lt 10 t 15 g m da ly n m t wh h m t th lt q nts f a w t nt k pt 4 l t l ly Wh t g idt l g m f lt h ld b o med f h l t f wat n f 4 l t d ly W th h a y w k h t l m t 20 t 30 g am d ly m y b m d w th m l nd d k g E th m t p d n t d or lt th n ally u p p lf ds lt h b how th t lt c l m t t pe p od w t that c t n ly b 1 0 5 g m t ff l t n t t w th a c t of 2 l 3 g m f w t of th l m t d pe C n eq tly ft l m t at d f f lt h y d th t f d food d ppe o mill ll t A u t bl ll w f w t l d t 2 5 l t d ly m t t es A l ry t d d l d pe m m y h lt f r h l f f od M t f th q t t l t f d p p d f d At w k b t w th q m m y nt f 5 t 3 l t d l W t h ld b l w d d l b m t f th u ly d q t gu l o t k pt f f t l k pe

ADULT REQUIREMENTS FOR IMPORTANT DIETARY ESSENTIALS AS MET BY COMMON FOODS

l od	Am t M a	Am t Gm	C lo-	P o- t Gm	C Gm	P Gm	F Mg	V tam A I U	V tam Th m e (B) Mg	V tam A bc A d (C) Mg	V tam R b- fl (G) Mg
M lk h l ast ed	1 pt	488	3 0	16 0	0 53	0 42	1 2	0	23		1 06
Me t (be f d l)		125	200	27 0	0 02	0 26	3 8	50	23		0 28
Egg	1	50	75	7 0	0 03	0 10	1 5	750	07		0 18
P t t		120	100	2 5	0 01	0 0	1 1	48	15	10 0	0 07
V g t bl (bb g w)	/ p	50	15	1 0	0 0	0 02	0 2	55	05	17 5	0 05
(B g)	/ cup	60	25	1 5	0 03	0 03	0 7	720	05	4 8	0 06
F t (ang)	/ p	115	60	1 0	0 02	0 02	0 3	110	13	62 0	0 07
(l f esh)	1	100	60	1 0	0 01	0 02	0 3	15	06	4 0	0 18
Whol l (wh t)		28	1 0	3 0	0 01	0 10	1 3	5	13		0 07
B d wh t h d	6 l	170	600	15 6	0 13	0 14	1 5		38		0 30
B tt	5 tb p	65	500	60 6	0 01	0 01	0 1	2762			
T t l			055	76 3	0 82	1 17	12 0	5265	1 49	98 3	2 22
St d d ll			2500	70 0	0 80		12 0	5000	1 50	75 0	2 20

N t Th sta d d ll f d t th t bl f a ad lt ma f d t ry p t Th mp t t of th tabl e b d h fly table 23 (E t l (N t t H C Sh m d C I n Sh m L f d M m lla 1940 The fig h y ty p p es t mpo t t f food t t ts V t m l h b en p sed t rma f t t o l u ts f V t m A a d t m f m llig m f th m b c d d b fl Th l getabl d f t h e pe fi d h b n s l ted f ll t t p rpos s nly Wh th g t bl d f ts hos th t t l f d l s e pe lly th t m l w ll a y t m t t

FOOD VALUES OF AVERAGE SERVINGS AND MEASURES[1]

F od	Amo t f s rvi g: W ght Gm	Amo t f s rvi g: App imat M	C mposition: P o t Gm	C mposition: F t Gm	C mposition: Ca bo- hyd at Gm	C mposition: C lo- ri	C mposition: F Mg	C mposition: Ca Gm	C mposition: P Gm
M t									
B f o d f t fre	50	3 3/ /	11 1	1 4		57	2 05	0 007	0 120
B f o d l a	50	3 3/ /	10 0	4 0		76	2 05	0 005	0 106
S l t k	100	/ t k	18 0	18 0		234	3 7	0 010	0 182
B f b t m d f t	100	1 sl / th k	22 3	28 6		347	4 9	0 013	0 240
Be f t de l b led	100	1 m ll t k	23 5	20 4		277	4 9	0 013	0 240
B f d d	15	1 l 4 5	4 3	1 0		26	0 18	0 014	0 018
B i d ed c m d	100	/ p	8 2	11 0	7 1	160	1 26	0 090	0 125
B f st w get bl	100	/ p	5 3	4 6	12 9	114	1 58	0 0 2	0 080
B f j	30	1	1 5	0 2		8	1 33	0 002	0 009
B f t gue	40	2 th l	7 0	4 0		64	1 2	0 004	0 086
Beef l	100	1 l 5 2/ /	20 4	4 5	1 7	129	8 1	0 018	0 220
Ba ook d	30	4 p t p th k	5 0	15 0		155			
B ooked	30	6 p t p th	5 0	15 0		155			
B f h a t	100	Sl 2 3 1 t	16 0	20 0		248	4 8	0 009	0 172
Ch k	100	/ b t	19 3	16 3		224	0 70	0 001	0 208
Ch k	50	3 th l wh te	10 0	8 0		112	0 35	0 005	0 104
Ch k	7	1 s d j t	8 5	7 0		100	0 50	0 007	0 140
G a y	30	2 tb p th k d	2 0	3 0	1 0	31			
G a y	30	2 tb p m t t k		0 5		5			
H m c ld b l d	60	2 l 4 2/ / l g n	11 0	12 0		153	1 02	0 007	0 130
H m m k d m d f t	100	4 / 4 / /	16 3	18 8		414	1 4	0 009	0 176
L mb a t	100	4 4 / n	19 7	12 7		193	1 7	0 011	0 212
P k t l	100	4 / 3 /	20 0	19 0		250	1 5	0 012	0 219
B l d po k h p	75	1 g	12 0	17 0		200	1 5	0 012	0 219
I k g	50	3 3 l g w	6 5	22 1		227	0 50	0 004	0 070

F h									
H 1 b t	100	1 g 3 2 1/	18 6	5 2		121	0 93	0 0 0	0 214
S lm d	70	A ag g / p	15 3	8 5		138	0 58	0 016	0 1 0
T ed l	70	A g rv g / p	16 6	14 0		192	0 91	0 018	0 164
Sh mp	100	10 m d m	25 4	1 0	0 2	111	2 67	0 0 8	0 292
Oy t	100	4 1 g	6 0	1 3	3 3	50	3 14	0 052	0 155
D y									
B tt	10	1 q 1 h		8 5		76		N gl g bl	
Ch tt g	100	/ p	20 9	1 0	4 3	110	0 03	0 124	0 1 7
Ch e m	30	/ k 1 2 1	7 8	10 1	0 7	129	0 39	0 024	0 027
Ch es Am i	20	1 h b	6 0	7 0		87	0 26	0 130	0 072
Ch S	20	1 h b	5 6	7 0	0 2	86	0 26	0 216	0 162
C m 20 pe t	30	1 2 t bl p	0 7	5 5	1 3	57	0 060	0 028	0 0 6
C m 40 p t	30	1 2 t bl p	0 6	12 0	0 9	114	0 060	0 0 6	0 0 0
M lk wh l	500	1 p t	16 5	20 0	25 0	346	1 200	0 600	0 465
M lk k m	100	/ t p	3 4	0 1	5 1	34	0 250	0 122	0 096
M lk k tt m lk	180	6 m d m gl	6 0	1 0	9 0	69	0 450	0 219	0 172
Egg wh le	50	1	6 7	5 0		72	1 26	0 033	0 090
I gg y lk	18	1	2 8	6 0		65	1 14	0 021	0 079
Egg wh t	32	1	4 0			16	0 03	0 005	0 005
I t									
I d	15	1 t bl poo		15 0		135			
O l	15	1 t bl poo		15 0		135			
May	15	1 t bl poo		13 0		117			
N t									
Al d	10	10 1 d	2 1	5 5	1 7	65	0 407	0 023	0 046
fea t	15	/ p	3 8	5 8	3 6	82	0 136	0 010	0 060
F	15	12 hal	1 6	10 6	2 0	109	0 37	0 012	0 048
I gl h w l t	15	/ p 4 t	3 0	9 0	2 0	100	0 030	0 014	0 050

I gu t I bl
1 Ad pt 1f m D t Outlf U t M h 1R If p t 1 Ch g Ill 1937
2 F N t itl e V 1 f I ood by D thy S W ll A A b M h

FOOD VALUES OF AVERAGE SERVINGS AND MEASURES (*Continued*)

F od	Am t f S k: W ght Gm	Am t f S k: App m t M	Compos ti n: Pro-t Cm	F t Gm	C bo-hyd at Gm	Calo-es	F Mg	C Gm	P Cm
C e l									
B fl k	(	/ t	2 5	1 3	8 1	44	1 28	0 180	0 182
C fl k	15	/ p	1 0	0 3	12 3	58	0 435	0 003	0 003
F ooked	100	Sm ll	2 2	0 3	15 3	73	0 14	0 003	0 020
O tm l ooked	120	/ cup g / p	2 7	1 2	11 0	66	0 63	0 011	0 065
R e t med	80	/ p	1 5		15 0	66			
Sh edd d wh t	30	1 b s t	3 6	0 5	23 0	111	1 3	0 011	0 091
M k d	100	/ p	3 3	1 5	15 8	80	0 26	0 005	0 032
B t b k g powd	35	2 m ll b cu ts	2 5	2 9	34 4	94	0 0	0 022	0 031
B ead wh t	40	1 f ce 3 / 3 / /	2 8	0 4	15 8	8	0 30	0 008	0 0 8
B d g h m	30	1 f c	2 7	0 5	15 5	78	0 5	0 015	0 052
B d y	30	1 l e 3 / 4 / /	3 0	0 2	16 0	77	0 48	0 007	0 044
G h m k	8	1	0 7	0 7	5 0	33	0 15	0 002	0 016
S lt e cr k	8	1 d ubl	0 8	1 0	5 5	34	0 10	0 002	0 008
Soda k	5	1	0 5	0 5	3 5	20	0 08	0 002	0 006
S g s									
S g	15	1 t blespoo			15 0	60			
H y	30	1 t bl po d 3			25 0	100	0 34	0 001	0 006
M l es	25	1 tablespoo			16 0	65	1 83	0 065	0 18
C y n	40	2 t bl poon			30 0	120			
J lly	0	1 t bl po			15 0	0			

F 1 (f h)									
Ap l t h P	150	1 m d m	0 6	0 7	1 3	94	0 54	0 010	0 018
Ap pl e	100	p	0 3	0 4	23 4	98	0 37	0 009	0 015
Ap t E I	50	1 m d m	0 5		6 0	26	0 31	0 ?07	0 012
A oc 1 pe	100	4 n h p	0 8	13 2	2 5	132	0 60	0 074	0 049
B	100	/ 1 g	1 3	0 6	2 0	98	0 60	0 009	0 031
Bla k h	100	/ p	1 1	0 5	17 8	80	0 77	0 019	0 031
Bl)	100	/ p	0 6	0 6	15 1	68	0 80	0 0 0	0 009
Ch rri	100	/ p	1 0	0 8	17 0	9	0 41	0 019	0 011
C b	100	1 p	0 4	0 6	10 0	45	0 40	0 017	0 011
G pe t E P	100	/ m d m	0 5	0 2	10 1	44	0 30	0 021	0 0 0
G p	100	l g b h / p	1 4	1 4	14 0	6	0 0	0 019	0 031
G pe) e	100	/ gl	0 4		18 5	76	0 30	0 011	0 011
Lem n j i	15	1 t bl poo			1 5	6			
Muskm l A I	180	/ l t 4 / d m	0 6	0 2	5 8	27	0 40	0 017	0 015
O g	150	1 m d m	1 3		16 8	73	0 70	0 060	0 031
O ange j ice	30	2 tabl po			4 0	16	0 06	0 005	0 004
P ch E P	100	1 a g	0 5	0 1	12 0	50	0 33	0 016	0 024
Pear E I	100	1 g	0 7	0 4	15 8	70	0 32	0 015	0 0 6
Plum E P	100	2 m d m	0 7	0 2	12 9	54	0 56	0 020	0 032
St be es	100	/ p	0 8	0 6	8 1	41	0 68	0 041	0 280
W t m l n	100	E P of / 1 1 / th k	0 5		6 9	9	0 23	0 011	0 031
Fr it (d i d)									
Ap i t	50	7 m d m h l	2 3	0 5	31 2	138	3 80	0 033	0 058
Dat	50	8 with d	1 1	1 4	39 0	174	1 78	0 032	0 028
Fig	50	5 ook d	1 4	0 1	24 7	105	1 43	0 081	0 058
P un	75	2 cook d 1 tb j c	1 0		36 6	150	1 42	0 0 7	0 050
Rai ins	50	/ cup ook d	1 1	1 5	34 2	155	2 84	0 032	0 065

3 F gu gi n f f h f ts Fo ooked o c d w th g add 10 to 15 gram b hydr t
4 W th s gar added cooking ing

FOOD VALUES OF AVERAGE SERVINGS AND MEASLRFS (Conti ued)

Food	Am u t f S r g		C mpo t						
	We ght Gm	App x mat Measu	Pro-t n Gm	F t Gm	C bo-hyd ate Gm	C lo-es	Fe Mg	Ca Gm	P Gm
\ getabl									
A pa ag s ooked	50	3 3 (b p es	1 0		1 5	8	0 48	0 015	0 019
Bea l ma	100	/ c p c k d	4 0	0 3	14 6	77	1 9	0 035	0 075
Bea n y b k d	100	/ p	6 9	2 6	0 0	128	2 05	0 042	0 340
Bea st i g ook d	100	/ p	1 0		3 0	16			
Be ts	100	/ p cooked	1 0		8 0	36	0 85	0 0 9	0 039
B l p ts	100	/ c p	4 4	0 5	7 6	52	1 17	0 027	0 120
C bbag	100	1 / ups w	1 4	0 2	5 3	28	0 43	0 043	0 029
C bbag	100	/ cup ook d	1 4		3 0	16			
C ots	100	/ p ooked	1 2	0 2	9 3	44	0 64	0 056	0 046
C ul f w	100	/ p ook d	1 0		3 0	16	0 65	0 094	0 042
Cel ry h a ts	70	1			1 0	4	0 21	0 025	0 016
C l ry st lk	30	P ut p p	1 3	3 0	3 0	19	0 62	0 0 8	0 01
C m f h A P	170	1 6 b	1 5	0 5	9 0	46			
C m n d	150	/ cup	3 0	1 0	19 0	97	0 47	0 006	0 103
C c mbe	100	/ P, l ces	0 3		1 1	6	0 16	0 0?8	0 016
Lett	50	/ h d	0 8		2 0	12	0 30	0 030	0 030
Ol e i	70	5 a e g	0 3	5 0	0 8	49			
Ol gr	20	10 ag	1 0	15 0	1 0	143			
On d y	70	4 1 / d am	1 0		10 0	44	0 48	0 034	0 045
O y g g	100	4 sm ll	0 2		2 0	8		N gl g bl	
P p	20	/ p b	1 5	0 5	18 2	79	0 77	0 0 9	0 076
P w	100	p	6 7	0 4	17 7	101	2 07	0 028	0 127
P	100	/ up 1	3 0	0 2	8 3	47			
P d ed	100	/ up	24 6	1 0	57 5	337	4 7	0 084	0 400

P ppe s g	100	1 m d um	1 2	0 2	5 7	29	0 40	0 006	0 0 6
P tat	120	1 m d tmd b ked	2 4	1 2	23 0	112	1 02	0 017	0 070
Potat m h d	100	/ p	2 0	6 4	15 7	129	0 3	0 0 8	0 060
P tato w t b L d	100	/ l g 4 / 2	1 8	0 7	26 9	121	0 77	0 019	0 045
R t b ga	100	/ p k d	1 0		8 0	36	0 36	0 074	0 056
Sp h	100	/ p t m d	2 3	0 3	3 2	24	2 55	0 067	0 068
Squash h bb d	100	/ p ook d	1 5	0 3	8 8	44	0 60	0 019	0 027
Sq b umm	100	/ p k d	0 6	0 1	3 9	19	0 35	0 018	
T mato	100	1 med um	1 0	0 3	4 0	23	0 44	0 011	0 0 6
T m t j	100	/ p	1 0		3 0	16	0 60	0 006	0 015
T m t d	100	/ p	1 2	0 2	4 6	23	0 44	0 011	0 026
T p	100	/ p k d	1 0	0 2	7 1	35	0 52	0 064	0 046
T p t p	100	/ p k d	2 9	0 4	4 2	32	3 48	0 347	0 049
Des e ts									
I m	120	p	5 0	10 0	15 0	1 0			
B k d t d	120	/ p	6 0	6 0	12 0	126	0 79	0 138	0 134
Rice cu t d	100	/ p	6 0	5 0	25 0	170			
Spo g k	45	1 p ec 3 2 / /	4 0	1 0	30 0	145			
S g ook	10	1 th 3 ch d m	0 7	1 0	9 0	48			
Appl p e[a]	130	/ p 9 h d am	2 1	9 2	42 8	262	0 46	0 011	0 0 6
Coc ut t d p e[a]	125	/ p 9 h d m	6 0	8 0	34 0	232			
G g b d	60	2 3 1	3 0	5 0	38 0	209			
Choc l t bl c m g	100	/ cup	3 3	6 2	23 3	162			
Pl l k	28	1 / ube	1 8	3 7	14 6	100			
Pl bl m g	100	/ p	2 9	3 4	20 0	123			
Wh te a	15	1 t bl poo	0 6	2 0	1 5	27			

2 F m N t tiv V l f T d by D othy S W ll An A bo M b
5 I e t mat g k d g t bl ll w 5 g m f b tt f h se g—th dd 36 l s
C p s d t d d (8) m g p (m g m A P p has d E P d bl po ti
Food a aly fg f m Go um t Bull t No 28 N 146 N 50
M l f m Sh m Ch m t y f F d a d N t t
F g e i h y type r p nt mp t t so f th a d t y t l
6 Pr sum bly cc t s c d bl am t of l t lable be f p b bl e n t ol bl al t

diet may be obtained *from* the more liberal use of whole grain or enriched cereals which supply iron *thiamine and other* factors of the *vitamin* B complex and green leafy vegetables tomatoes and yellow vegetables and *fruits* which are rich in vitamins A and C Vitamin D has not been included in the table because very little of this vitamin is furnished by ordinary foods and the average adult is *expected* to obtain his chief supply from direct irradiation of the skin with sunshine 200 International units of vitamin D may be obtained by the use of one *pint* of vitamin D milk

C SPECIAL DIETS

DIABETES

Aim To meet normal nutritional requirements keeping the *total dextrose formers* within *the* limits of carbohydrate tolerance and quantities of insulin prescribed and maintaining a *safe* ketogenic anti ketogenic ratio

Protein For adults sufficient to meet protein *requirements* For *children same* as for normal children of the same age and size

Total Calories For adults sufficient to maintain *weight* slightly below *average for* height age and sex and support the degree of activity required by the adult s occupation For children same as for *normal* children *of the same age and size*

Carbohydrates and Fats Calories not supplied by protein must be derived from carbohydrate and fat *The patient will usually be more comfortable and* more willing to adhere to the diet prescribed *if* fairly liberal amounts of carbohydrate are allowed—100 *to* 175 Gm *or more daily*—with enough *insulin to* keep the blood sugar at a safe *level* Dextrose equivalent of insulin = 1 0 to 2 0 Gm (av 1 5 Gm)

dextrose per unit of insulin Calories in excess of those supplied by protein and carbohydrate must be supplied by fat but the proportion of fat to carbo hydrate must be kept within the limits of a safe ketogenic antiketogenic ratio as computed from the Woodyatt equation

$$K = \frac{0\,46P + 0\,90F}{C + 0\,58P + 0\,10F} = \text{ketogenic ratio}$$

A ratio of 1 5 1 has been demonstrated to be safe When K = 1 5 F = 2C + 0 54P This ratio how ever does not permit the best retention of mineral elements Further as already pointed out a ratio of 2 0 1 may be considered more satisfactory for the child

Minerals and Vitamins Adequate amounts of minerals and vitamins must be supplied It is im portant especially in children s diets that the carbo hydrate allowance be liberal enough to permit the use of adequate amounts of milk fruits and vege tables Table 6 which is in use in the dietary de partment of Michael Reese Hospital Chicago is conveniently arranged for the calculation of the diabetic diet Other convenient tables may be found in Stern s Applied Dietetics and in the diabetic manuals published by Joslin Wilder and others For a fuller discussion of children s requirements see textbooks on nutrition and dietetics listed in the bibliography

Foods Specially Prepared for Use in Diets Restricted in Dextrose Formers There are available commer cially a number of foods designed for use in diets restricted in dextrose formers The Council on Foods and Nutrition of the American Medical Asso ciation believes that the majority of such foods are of limited usefulness and that the availability of insulin makes them no longer necessary Many of

FOOD CLASSIFICATIONS FOR THE CALCULATION OF DIABETIC DIETS*

V g tabl s nd F t

G o p I
Pr t 1 Gm C bohyd t 3 Gm

F d d S g	Gm
A p g (10-3 p)	100
B a i g (/ cup pa k d)	100
(bb g w (/ p)	50
C bb g (ok d / p)	100
C lf w (/ p)	100
C l ry (6 m ll h l)	100
C l y (/ p t lk)	100
(mbe (/ 8 l g 1 / d)	100
C (/ p)	100
Lett e (/ a e h ad)	100
Radi h (7)	50
Sa e k ((/ p)	90
Sj h (/ p)	100
T m t (/ p)	100
T m t (w-4) s / th k)	90
Lem) (1) m 2 / tbs)	30

Gr p II
P t 1 Gm C b hyd t 6 Gm

Food a d S ng	Gm
B ((2-5 st lk)	110
Eggpl t (2 l)	110
Ok (/ p)	90
O (bo l d- / n)	120
O l (w-1 /)	50
P mpk (/ l)	100
Appl (/ m ll)	40
A t (1 p t l / d)	50
B (t	100
(pefr t (/ m ll 4 / d)	100
O g (1 m ll)	50
St b es (1 p)	90
W t m l (/ (/ th)	90
Appl (/ p)	60
P b (/ p)	60

Gr p III
P ot t 1 Gm C rbohydr t 10 Gm

Food nd Serv ng	Gm
Beets (/ up)	110
(r t (/ c p)	100
P as (/ up)	100
Rutab g (/ p)	1 0
Sq h (/ p)	100
T l (/ c p)	120
Appl (/ a g (l)	70
B a ((m ll 6)	45
Bl kb (/ p)	30
C nb (/ p)	100
C pes (/ b h / p)	70
M km l (/ m l -4 /)	100
O g (1 l g)	90
P h (1 g)	100
P (/ g)	70
P p l (2 l t / thi k)	100
Pl m (2 m l m)	50
R t (/ p)	80
(l (t (/ (g)	150
T k (1 l g)	100

* A d l p d by th D t y D p tm t f th M h t R l H pit l
C p d t l d m g p- / p q l / t p / p q l l g g

		M at d M t S b t t t					
		Sm ll S ing P t 12 F t 14		A g S g F te 18 F t 21		L g S l g P t 24 F t 28	
		Gm	S rv g	Gm	Ser g	Gm	S g
Le m ts	B f (d t k)	50	3 3/ /	75	4/ 3/ /	100	6 3/ /
	Ch k	50	1 d m t k	75	1 m ll b t	100	1 b e t
	F h (h dd ck)	50	2 2 1	75	3 2 x 1	100	4 x 2 x 1
	L mb		S m b ef				
	S lm d	50	/ p	75	/ c p	100	/ p
	T g	50	3 1 / 4/ 6	75	4 1 9	100	6 1
	V al	50	3 3/ /	75	4/ x 3/ x /	100	6 x 3/ /
F t me t	S l t k	50	3 2 /	75	3/ 2 /	100	3 / x 3 /
	T d l t k	50	/ th k	75	/ th k	100	1 t de l
	R ast b f	50	2 sl e 3 2 /	75	3 th sl s	100	4 thin sl
	R t l mb	50	2 3 /	75	S m t b f	100	S m b f
	R ast l	50	S m t b f	75	S m t b f	100	S m b f
	Lamb h ps	50	1 h p /	75	1 h p / th k	100	2 h p /
V y f t m ts	P k a t	50	1 l 2 3 /	75	1 l 3 3 /	100	1 l 4/ 3/
	P k h p	50	1 h p /	75	1 h p g /	100	1 ch p 1
	H m t	50	1 l 4 5 4/	75	1 l 6 5 /	100	2 sl e 4 x 5 x /
	Ham ld bo led	50	l es 4 2 /	75	3 l 4 2 1/	100	4 l ces 4 x 2 x 1
M t b st t t s	S d	50	3 1 g 6 m ll	75	4 1 g 9 sm ll	100	6 l g 12 m ll
	Egg	100	T o	150	Th	00	F
	C tt g h	60	2 d d tb	90	3 d d tb	120	4 d d tb
	d m 40%	30	2 tb	50	3 tb	60	4 d d tbs
	Am h es	40	2 1 1	60	3 1 x 1	80	4 x 1 1
	C m h e	50	/ k	75	1 k	100	1 / c k s

FOOD CLASSIFICATIONS FOR THE CALCULATION OF DIABETIC DIETS (*Contini ed*)

(eals
O e s g w ll f ı h—P t ı 2 Gm —C bohyd te 10 Gm

Food	Dry We ght ı Gm	Cook d W ght Gm	Ser ı g
O tm al	13	100	/ı cup
F a	13	100	1/ cup
Wh t	13	100	/ı c p
C flake	12		/ cup
P ff d	13		/ c p
Puffed heat	14		1 cup
Sh edded whe t	13		/ b t

M ll o

F d	Gm	S rv ng	P	F t	Ch	Food	Gm	S g	P	F t	Cho
C m 20%	100	/ t a cup	3	18	5	B na	100	1—(1 g	2		22
C m 40%	100	/ p	2	40	4	G ape ;	100	/ p	1		16
M lk	180	gl	6	7	9	C	100	/ cup	4	1	20
B tt rm lk	180	1 gl	6	1	9	P ps	100	/ p	2		16
Wh t b d	30	1]	3		16	P t t	120	m ll	3		25
Ry b d	30	1 sl	3		16	Ol	20	Tw		5	2
S lt	10	1 d bl	1	1	5	W] t	15	8 h)	3	10	2
Egg	50	On	6	5		B tt	10	1 sq		8	
B l		/ b l	21	3		M y se	15	1 tb		12	
Li r	100	1 l c	20	5	2	S l d l	15	1 tb		15	
Oy t	100	4 l g	6	1	4	B n (k d)	20	3	2	10	

these preparations are low in carbohydrates but contain excessive amounts of protein The Council has ruled that to be eligible for acceptance such foods excepting in cases of special adaptability shall contain dextrose formers yielding dextrose in an amount *not greater than 3 3 Gm dextrose per 100 cc* (computing the dextrose equivalence as the carbohydrate plus 58 per cent of the protein plus 10 per cent of the fat content of the food) The labels of accepted products must state the approximate protein fat and carbohydrate content of the finished product Among the special products which have been accepted by the Council as suitable for use in carbohydrate restricted diets are canned water packed vegetables canned fruits packed either in water or in unsweetened fruit juice gelatin dessert powders sweetened with saccharin and one brand each of breakfast cereal flour and bread substitutes prepared chiefly from washed bran cellulose India gum and mineral oil The latter provide no food value but act as fillers and carriers of butter and cream Detailed information regarding the accepted products may be obtained from the Council office

KETOGENIC DIET

Aim To produce a strongly acid urine (*p*H 5 5 or less) with marked ketosis The diet must contain sufficient protein to meet minimum requirements and approximately 35 calories per kilo for adults and 50–65 per kilo per day for children The ketogenic antiketogenic ratio is maintained at 1 5 1 to 4 1 or higher The formula for computation of a diet of any desired ketogenic ratio is as follows

Fat = R × (C + P)
Total calories = 9 × [R(C + P)] + 4C + 4P
R = Ratio (1 5 2 2 5 etc) of fat in diet to C + P
C = Grams carbohydrate in diet
P = Grams protein in diet

The results obtained with this formula have been shown to conform very closely with Woodyatt s gram ratio of fatty acid and glucose * For the higher ketogenic ratios carbohydrate must be derived chiefly from 3 per cent vegetables and 10 per cent fruits (see table p 142) The specially prepared bran wafers breakfast foods and cellulose flours previously described (p 145) are useful in the keto genic diet Milk must usually be omitted because of its high content of dextrose formers To insure adequate calcium and vitamin intakes small doses of calcium (2 to 3 grams of tri calcium phosphate) and concentrated sources of thiamine and riboflavin are frequently required Orange grapefruit or tomato juice should be included daily if the carbohydrate allowance will permit If not crystalline vitamin C may be resorted to Cod liver oil should be used as a part of the fat of the diet because of its high vitamin content

DIETS FOR PATIENTS WITH PEPTIC AND DUODENAL ULCERS

Aim To provide for normal nutrition with the least possible irritation of the gastrointestinal tract In the early stages a liquid diet is used with later transition to a smooth soft diet

Variation from the Normal Consistency Foods used must either be free from fiber or pureed Fruit juices should be well strained

Flavor All chemically irritating foods—sweet sour spiced or highly salted—must be omitted

Gastric Stimulation Strong gastric stimulants—

* Talbot F B Metcalf K M and Moriarity M E A Clinical Study of Epileptic Children Treated by Ketogenic Diet The Boston Medical and Surgical Journal 196 89 (Jan 20) 1927

meats meat extractives strongly acid fruits tea coffee and alcohol—must be omitted

Number of Feedings Frequent small feedings are necessary to prevent accumulation of free HCl and development of strong hunger contractions

Proportion of Protein Other than Meat Protein Proteins derived chiefly from milk and eggs are given in large amounts to bind the HCl of the gastric secretion

Proportion of Fat Comparatively large amounts of easily digestible fats such as cream butter and olive oil are used because of their inhibitory effect on gastric secretion

Vitamin and Mineral Content It has been suggested that concentrated sources of the vitamins particularly vitamin C should be added to the restricted ulcer diet especially if the ulcer shows a tendency to hemorrhage The restricted diet may be low in vitamins and may lead to specific avitaminoses if continued over too long a period of time Patients should be kept under strict supervision until an adequate diet has been attained To prevent anemia medicinal iron may be necessary

SIPPY DIET FOR USE IN PEPTIC ULCER

Hourly feedings from 7 a m to 7 p m should be given for at least the first two weeks Two hour intervals may be employed thereafter A Sippy Diet schedule follows

1st to 3rd day—3 ounces of a mixture of equal parts of milk and cream at each feeding

4th to 9th day—Add gradually soft cooked eggs and well cooked cereals (refined or strained) until the patient is receiving a about the

10th day—Hourly feedings of milk and cream mixture plus three soft eggs one at a time and 9 ounces of cooked cereal 3 ounces at one feeding

After the 10th day other soft foods are added cautiously usually in the following order Toast with butter potatoes, fruit juices, pureed fruits pureed vegetables and tender meats

The diet may be varied occasionally by the use of cream soups jellies marmalades and simple desserts such as custard tapioca cream, rice pudding (without raisins) and gelatin As long as food is taken every hour the total bulk at any one feeding should not exceed 6 ounces The patient should as a rule remain in bed for three to four weeks If desired a sufficient quantity of food may be given to cause a gain of 2 or 3 pounds each week

DIETS FOR FEBRILE CONDITIONS

Variations from Normal

Consistency Foods must be easily digestible liquid semi liquid or soft and bland in flavor

Energy Requirement Basal heat production is increased 13 per cent for each degree C rise in temperature (7 2 per cent for each degree F) Calorie requirements are further increased by excessive toxic destruction of body tissue and by restlessness of patient For fevers of long duration such as typhoid average caloric requirements are from 60 to 80 calories per kilogram or a total of 3 500 to 5 000 daily

Protein Requirements Protein destruction may be increased up to three times that in health depending on the severity of the infection

Carbohydrate Requirement The diet should contain a large proportion of carbohydrate because of the protein sparing action of this constituent

Vitamin Requirement Vitamin losses especially vitamins A thiamine and ascorbic acid losses appear to be greater in fever and other acute infections than in health Vitamin intakes should therefore

be maintained at normal levels or above The use of crystalline ascorbic acid and other vitamins may be required

Fluid Intake Maintained at a level sufficient to prevent dehydration and aid in elimination of toxic products

Full details of standard diets proposed by Mc Lester and others for use in typhoid and other fevers of long duration are found in texts on diet in dis ease listed in the bibliography In fevers of short duration as in pneumonia and other acute infec tions it is less important that the total caloric and protein requirements be met since the body can draw on its own reserves in short illnesses It is probable that a high vitamin intake should be maintained because the stores of these substances are often small and rapidly depleted A standard liquid diet with emphasis on milk eggs fruit juices cereal and meat broths and thin vegetable purees is usually satisfactory

DIETS FOR PATIENTS WITH NEPHRITIS

Aim To modify the normal diet to meet the existing kidney pathology Abnormalities which may exist are fluid retention retention of urea uric acid etc and albuminuria To prevent edema fluids must be restricted to the quantity which can be excreted by the patient and salt poor or salt free diets may be required The protein intake must usually be restricted although it should be increased if marked albuminuria with reduced serum albumin (nephrosis) is present Except in acute conditions of short duration, protein should not be reduced below minimum requirements be cause lower protein intakes merely result in the breakdown of body protein the waste products of which must be eliminated in the usual manner

Milk and eggs are preferred sources of protein because free of purine bodies which may be harmful to the kidneys Condiments and otherwise highly flavored foods should be avoided because irritating to the kidney

SALT POOR DIETS

Moderate restriction of the sodium chloride in take is generally recognized to be beneficial in all forms of nephritis particularly when edema is present If minimum amounts of salt are used in cooking no salt is added at the table and no highly salted foods are used the intake is equivalent to approximately 2 to 4 grams of sodium chloride daily Restriction of the salt intake beyond this point is considered unnecessary and if rigidly em ployed may be distinctly harmful

LOW PURINE AND ALKALINE DIETS

Other diets which are sometimes used in the management of nephritis as well as other condi tions are the low purine and the alkaline diets Foods low in purine content are milk and milk products eggs refined cereals including white bread potatoes cabbage lettuce cauliflower onions tapioca and similar foods which are low in nuclear material Foods which should be avoided are meats meat extracts meat soups oatmeal legumes (peas lentils and haricot beans) and tea coffee and cocoa as well as other products which are relatively high in nuclear material To produce a diet which is potentially alkaline it is necessary to substitute foods having an alkaline ash in place of foods having an acid ash Important foods hav ing an alkaline reaction are fruits particularly citrus fruits and tomatoes and vegetables partic ularly lima beans, navy beans beets carrots

potatoes celery and lettuce Foods having an acid ash are meat fish and other sea foods eggs and cereals particularly oatmeal and rice The ash of certain fruits cranberries and prunes is alkaline but because of the benzoic and other sources of hippuric acid which they contain they lead to the formation of an acid urine

HIGH CALORIC DIETS

Aim To produce gains in weight or to maintain weight in hyperthyroidism and wasting diseases Diets providing as much as 4 000 to 5 000 calories are frequently required in hyperthyroidism tuberculosis and cases of underweight and undernutrition It is usually necessary to furnish the needed calories in small bulk and readily digestible form because anorexia and impaired gastrointestinal function are frequently present It may also be advisable to provide five or six smaller meals daily at regular intervals and as a part of the regular program rather than to try to take the necessary calories in three large meals Of the fats butter cream olive oil and bacon fat are considered the most easily digestible Large amounts of butter may be concealed in hot breakfast cereals mashed potatoes baked potatoes and buttered or creamed vegetables and extra amounts of butter or cream may be incorporated in cream soups gravies or cream sauces Forty per cent cream (heavy whipping cream) may be used Other means of increasing calories without increasing bulk are the liberal use of sugar (particularly dextrose) as such or as it occurs in jellies marmalades honey and other syrups *Cream eggs and sugar may* be added to milk or fruit beverages Lactose and dextrose are advantageous for this purpose because they are less sweet and less readily fermentable

than cane sugar The various commercially pre pared beverage bases containing different combina tions of dried milk malted milk, sugar, dried egg powder cocoa and sometimes wheat germ and cod liver oil are also useful

LOW CALORIC DIETS

Aim For weight reduction In cases of obesity restriction of the energy intake must be accom plished without reduction of other dietary essen tials Therefore the daily intake of protein min erals and vitamins should be much higher in propor tion than that provided by the ordinary diet The natural foods of which such a diet principally ought to be composed are skimmed milk leafy vegetables fruits without added sugar and lean meats In addition thiamine must be supplied in concentrated form The total calories should be below the amount required to maintain the patient s ideal weight (see table 4) For strict reducing diets intakes of from 1 000 to 1 500 calories are usually employed Weight losses should not be greater than from 1 to 2 pounds weekly To secure the patient s full cooperation the diet should have sufficient satiety value to prevent premature hunger and promote a feeling of well being For this purpose emphasis should be placed on bulky vegetables and fruits of low caloric value and on meat eggs and other foods of high protein content Small amounts of fat and sugar are also helpful in satisfying the appetite and lengthening the time the food remains in the stomach

D SPECIAL VITAMIN PREPARATIONS

Such preparations are useful in treatment of the avitaminoses and for increasing the vitamin intake in pregnancy and lactation in reducing diets in

acute infections and in all conditions in which a high vitamin intake is desirable For preparations accepted by the Council on Pharmacy and Chemistry of the A M A see New and Nonofficial Remedies Wide variations occur from product to product See label or N N R

VITAMIN D MILK

The Council on Foods and Nutrition is of the opinion that of all the common foods available milk is most suitable as carrier of vitamin D Vitamin D is concerned with the utilization of calcium and phosphorus of which milk is an excellent source The Council has made the decision that for the present milk is the only common food which will be considered for acceptance when fortified with vitamin D

The Council accepts fresh (pasteurized) and evaporated and powdered vitamin D milks which contain 400 U S P units of vitamin D per quart and which meet certain other requirements The evaporated vitamin D milks contain the same number of units per reconstituted quart (after dilution with an equal volume of water) as do the corresponding fresh (pasteurized) milks The metabolized yeast milk is produced by feeding irradiated yeast to cows

E INFANT FEEDING PREPARATIONS

The Council on Foods and Nutrition has reviewed and accepted a considerable number of infant feeding preparations They include modified milks special carbohydrate mixtures for use in formula preparation strained and chopped vegetables fruits and meats Producers of Council accepted products are permitted to use the Council s seal of acceptance on their labels

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PART VII

PHYSICAL MEDICINE

Physical Medicine is defined as the diagnosis and treatment of disease by physical as distinguished from chemical and biological procedures. The treatment of disease by physical means is called physical therapy and a Doctor of Medicine who makes this his specialty is called a physiatrist. Physical medicine includes the employment of the physical and other effective properties of light and other radiations, heat and cold, water, electricity, massage, manipulation, exercise and mechanical devices in the diagnosis and treatment of disease.

Brief but explicit accounts of the various therapeutic procedures used in physical medicine and of certain well established effects can be found in the "Handbook of Physical Medicine," which contains articles published by the Council on Physical Medicine of the American Medical Association. That which follows here may be thought of as a check-list for making sure that a patient receives the advantage of everything that modern medical science has to offer.

A. HEAT

INFRA-RED GENERATORS

These units usually consist of a concave reflector at the focus of which is the heating element. This may be either an incandescent bulb, usually tungsten filament, as found in bakers or light cabinets as well as lamps, or a nonluminous metal core or coil

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The former near infra red rays are directly absorbed with less surface heating than the latter far infra red rays (non luminous source) which heat the skin surface to a greater extent and penetrate largely by conduction Therapeutic indications for the use of external heat can be grouped under two headings general and local General radiation is used for systemic effects principally in the treatment of acute and chronic arthritis nephritis and rheumatoid conditions Local radiation is used chiefly in fractures dislocations cicatrices sprains contusions and other conditions such as myositis neuritis chronic arthritis and circulatory disturbance of the extremities Following local exposure there is an increased circulation of blood through the irradiated area which tends to keep the temperature of the tissues constant The blood is warmed by this procedure However it is difficult if not impossible to heat up deep lying structures by increasing the degree of heat or prolonging the applications because the heat regulating mechanism of the body operates to maintain the temperature of the blood at normal Superficial structures such as skin tendons and fibrous tissue are actually heated to a limited degree and may even be injured by careless application

PARAFFIN BATH

In hand or joint cases heat may be applied by immersing the part in or painting it with warm paraffin (75 80° C) melted in a double boiler The part is dipped and withdrawn or painted repeatedly until encased in a coating of paraffin which retains the warmth Paraffin baths are used after fractures joint injuries or to soften scar tissue

as used in the ordinary bath room heater It is customary to use an incandescent lamp or carbon arc (with ultraviolet emission screened out) where relatively deeper penetration is desired (emission concentrated between 7 600–15 000 angstroms penetrates 10 to 30 mm) the radiant heater is used for superficial penetration (emission chiefly between 15 000 and 150 000 A penetrates 1 to 0.05 mm)

Sources of Heat

Source	Form of Energy	Heat Transmitted
Hot water bottle Hot compress Hot water bath	Long infra red rays (non penetrating)	By conduction
Hot air bath Steam bath	Long infra red rays (non penetrating)	By convection
Electric heating pad	Long infra red rays (non penetrating)	By conduction and radiation
Infra red generator (non luminous)	Long and short infra red rays (slightly penetrating)	By conduction and radiation
Incandescent light bulb (heat lamp) (luminous)	Visible rays—short infra red rays (moderately penetrating)	By radiation
Carbon arc lamp Sun	Short infra red rays Visible rays Ultraviolet rays	By radiation
Diathermy apparatus	High frequency oscillations (100–600 meter wavelength)	By electric oscillations
Short wave diathermy apparatus	Short radio wave (3 to 30 meters)	By electric oscillations

changes in the bones joints bursae, muscles ligaments and tendons Salpingitis may be treated by diathermy In arthritis diathermy sometimes is of benefit clinically but is contraindicated in many chronic cases because it may aggravate local symptoms However it improves the circulation in circulatory disturbances of the extremities in certain selected cases Diathermy is to be used merely as an adjunct to other forms of treatment Medical diathermy is contraindicated in the following cases In diseases or injuries where simpler methods of applying heat will give satisfactory results acute inflammatory processes (such as acute non draining cellulitis acute infectious arthritis and acute pelvic infection) conditions where there is a tendency to hemorrhage (such as gastric ulcer) areas where heat sensation is impaired or lost (as in peripheral nerve injuries) through abdomen pelvis or lower back during pregnancy menstruation (36 hours before or after included) and over areas of suspected malignant growths

2 *Surgical diathermy* is defined as the use of a high frequency current for any surgical purpose

a Cutting current biterminal high frequency current obtained from the primary winding of the high frequency oscillator

b Electrocoagulation biterminal (and at times monoterminal) high frequency current obtained from the primary winding of the high frequency oscillator

c Electrodesiccation Monopolar high frequency current from the secondary winding of the high frequency oscillator

For the physical characteristics of these currents the therapeutic indications for their use and certain physiologic effects the intern is referred to the Handbook of Physical Therapy

DIATHERMY

1 *Medical diathermy* is the use of high frequency currents to produce heat in body tissues for thera peutic purposes insufficient in degree however, to produce temperatures high enough to injure or destroy the tissues When the current has a fre quency of from one half million to three million cycles per second corresponding to wavelengths of from 100–600 meters the procedure is termed conventional diathermy Short wave diathermy on the other hand utilizes wavelengths from 3 to 30 meters with corresponding frequencies from 10 000 000–100 000 000 cycles per second The spark gap and vacuum tube oscillator are the two types of units generating these currents Generally speaking the spark gap is u ed for conventional diathermy and the vacuum tubes for short wave units although short wave energy may be gener ated by the spark gap unit Conventional dia thermy is applied by means of metal contact electrode plates Short wave *diathermy* is applied in two ways (1) by metal plates covered with rubber or other insulating substances placing the tissues in a high frequency electric field—cuffs, pads and air spaced electrodes are used in this manner or (2) by means of a rubberized cable coiled around or on top of the part to be treated plac ing the tissues in a high frequency oscillating elec tromagnetic field While short wave diathermy is easier to apply there is at present no adequate means of accurately measuring dosage Available evidence indicates in general that the therapeutic effects are limited to the heat produced

Well established evidence indicates that the local application of heat is effective as an adjunct in the treatment of certain traumatic or inflammatory

changes in the bones joints bursae muscles ligaments and tendons Salpingitis may be treated by diathermy In arthritis diathermy sometimes is of benefit clinically but is contraindicated in many chronic cases because it may aggravate local symptoms However it improves the circulation in circulatory disturbances of the extremities in certain selected cases Diathermy is to be used merely as an adjunct to other forms of treatment Medical diathermy is contraindicated in the following cases In diseases or injuries where simpler methods of applying heat will give satisfactory results acute inflammatory proces es (such as acute non draining cellulitis acute infectious arthritis and acute pelvic infection), conditions where there is a tendency to hemorrhage (such as gastric ulcer) areas where heat sensation is impaired or lost (as in peripheral nerve injuries) through abdomen pelvis or lower back during pregnancy menstruation (36 hours before or after included) and over areas of suspected malignant growths

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B MASSAGE

Massage properly prescribed is one of the most important physical measures available Its principal effect is to increase local circulation The physiologic effects are described in detail in the Handbook of Physical Therapy Massage is most effective when used after heat has been applied to the part to be treated The various movements used in massage are as follows

(1) Stroking (a) Superficial stroking need not be directed but may be in optional directions It consists of slow gentle rhythmic movements given for their reflex effect on cutaneous structures (b) Deep stroking should be unidirectional to aid instead of opposing the venous bloodflow toward the heart It is given for its mechanical effect in emptying veins and lymphatics and while the individual strokes are in the direction of the venous bloodflow the first strokes are usually applied to the more proximal parts and the later strokes to the more distal parts so as to clear the pathways for venous and lymphatic return

(2) Kneading In kneading the deeper structures are manipulated through the skin Muscles tendons and adhesions are stretched venous and lymphatic circulation is aided and the removal of waste from muscles is hastened

(3) Friction The fingers or hand are applied to the patient s skin in such a way as to move the skin and superficial tissues back and forth over the deeper structures Friction is used to loosen scars and adhesions and to aid in the absorption of local effusions

Be sure that the part to be treated is relaxed and comfortable and that no tight clothing is binding it Massage should never cause pain and is not used

over bones or joints which are painful or swollen The length of treatment is about 10 minutes to arm or shoulder and 10 to 15 minutes for leg or back

Massage can be effective only in the hands of a well trained physician or technician who is sufficiently well acquainted with the anatomy physiology and pathology of the existing condition to understand the results to be achieved and who can apply the proper measures toward that end Surgical and medical cases suitable for treatment by massage include the following fractures dislocations sprains stiff joints peripheral nerve injuries tendon sutures anterior poliomyelitis some forms of chronic arthritis cardiac decompensation peripheral circulatory disturbances other types of chronic disease and certain types of neuroses when carefully supervised by the physician Heat and massage are most efficient preliminary measures used in preparing joints for active movements

Contraindications to massage are as follows fever or any debilitating complication malignancy acute phlebitis and myositis—except in very mild form The unduly rapid absorption of the detritus produced by massage may suffice to induce toxemia and even fever *especially in elderly persons*

C THERAPEUTIC EXERCISE

Therapeutic exercise is the use of scientifically supervised movements of the body with or without apparatus for the purpose of restoring diseased or injured tissues as near to normal function as is possible There are two types of therapeutic exercise active and passive Active exercise consists of three types assistive free and resistive Exercise lists may be procured from the Council on Physical Medicine American Medical Association

and many generally used exerci es are listed in th Handbook of Physical Medicine Of the many varieties of physical therapy, active exercise probably deserves first place because of its wide applicability and because it calls into play the entire neuromuscular unit in a manner approaching normal physiologic action

The Sling Suspension method of exercise, an important aid in restoring muscle power in infantile paralysis consists in supporting the arm or leg to be treated in a sling suspended from overhead, thus eliminating the weight of the extremity as a hindrance during movement These exercises are helpful in allowing the patient to translate even minimal and scarcely appreciable muscle power into active and readily demonstrable motion through a fair arc Other conditions in which sling suspension may be employed with benefit include spastic paralysis especially of the lower extremities and atrophic arthriti as well as cases of weakness and stiffness after fracture or injury

Of equal importance as an aid in muscle training are underwater exerci es While suitable for infantile and other types of paralysis, acute arthritis and weakness and stiffness of the extremities after injury this type of exercise will also be found useful in many instances in the field of internal medicine neurology and psychiatry The advantages of underwater exercises are that (1) the buoyancy of water eliminates much of the effect of gravity and (2) the warmth of the water relaxes the muscles and accelerates the blood flow If relaxation is to be achieved the water in the pool must be sufficiently warm It should be near body temperature 37° C or 98 6 F

In addition to the foregoing types of exercises

directed towards the individual joint there are general exercises directed toward better body mechanics which are of distinct benefit in certain chronic conditions A list of these exercises may be procured from the Council on Physical Medicine

Occupational therapy is an additional important aid in restoring function to injured joints The physician obtains the cooperation of the patient by assigning tasks involving the use of the injured part The patient while concentrating on the thing he is making forgets that he is also exercising and this relieves the exercise of its monotony It is also extremely helpful in cases in which the dis ability of the patient necessitates vocational re habilitation Here he may learn how to make prod ucts that will enable him to regain his self sufficiency when he leaves the hospital

D RADIANT ENERGY

The evidence available indicates that ultraviolet rays have a prophylactic and curative effect on rickets infantile tetany or spasmophilia and osteo malacia Prenatal irradiation of the mother and also irradiation of the nursing mother appear to have a definite and specific preventive influence on rickets This however requires general expo sure of the bare body Irradiation may also exert a beneficial action on other disorders of calcium metabolism but the limits of such action the con ditions under which it may best be produced and the specific action of the rays have not yet been fully explored

Benefit may be derived by patients suffering from tuberculosis of the bones articulations peritoneum intestine larynx and lymph nodes or from tuber

DIFFERENT SPECTRAL REGIONS PROBABLE DEPTH OF PENETRATION AND PROBABLE PHYSIOLOGIC ACTION OF RAYS FROM DIFFERENT SOURCES*
(COBLENTZ)

Spectral Region	Penetration of Rays	Physiologic Action	Source
Far ultra violet 1800 to 2900 A	Superficial 0 01 to 0 1 mm	Photo-chemical	Metals in carbon arc and spark of metals (mercury arc)
Near ultra violet 2900 to 3900 A	Superficial 0 1 to 1 mm	Photo chemical	Sun metals in carbon arc arc of metals
Visible spectrum 3900 to 7600 A	Deep 1 to 10 mm	Thermal nerve stimulation	Sun carbon arc
Near infra red 7600 to 15000 A	Deep 10 to 1 mm	Thermal nerve stimulation	Sun carbon arc gas filled tungsten and carbon filament incandescent lamps
Far infra red 15000 to 150000 A	Superficial 1 to 0 05 mm	Thermal nerve stimulation	Carbon arc infra red (radiant) heaters

* Wavelengths in angstroms A

culous sinuses, when the entire body is exposed to carefully graded doses of natural sunlight or of radiation emitted by certain artificial sources of ultraviolet rays The beneficial results of such irradiation appear to be partly due to ultraviolet radiation but it is probable that visible and infra red rays as well as the conditions of the atmosphere also play a certain ill defined part in the therapeutic effect As far as tuberculosis of the bones and joints is concerned the majority of those who have had extended experience with helio

therapy agree that suitable graded exposure to natural sunlight is more effective than exposure to artificial sources of radiation

Of the different types of artificial generators employed when sunlight is not available the majority of authorities express a distinct preference for the type of generator with a relatively continuous spectral emission which approximates the solar spectrum most closely In tuberculosis of the larynx and lymph nodes [1] this type of generator is preferred whereas in tuberculosis of the peritoneum[1] and intestine a distinct preference has not been evinced Local exposure to ultraviolet rays of circumscribed tuberculous lesions of the urinary bladder has been shown to yield distinctly favorable results but the method requires special applicators which are not generally available and above all special skill and experience in the cystoscopic diagnosis and treatment of bladder le ions

On wounds that do not heal or that are abnormally slow in healing local or general irradiation may have a beneficial effect However it is not clear that this is a specific effect of ultraviolet rays Exposure of the lesions of erysipelas including a wide area of surrounding tissue has a favorable effect but whether the results of ultraviolet irradiation are superior to or even as good as those obtain

1 This s not intended to mply that natural or artificial heliotherapy should be used to the exclusion of other methods In t ct especially in tuberculo is of the lymph nodes and the larynx heliotherapy ombined with roentgen the apy in expert h nds seems to yield the best results When tuberculosis of the lymph nodes bones articulations or other structures is com pl cated by pulmonary tuberculos s or when the tuberculous proc ess is confined to the l ngs ultraviolet irrad ation must be used with caution beca se in some ca es t may cause quiescent pul monary foci to be ome active

able by proper exposure to roentgen rays has not yet been established Numerous claims that ultra violet irradiation exerts a valuable therapeutic effect in secondary anemia have been advanced The evidence supports the conclusion that while, in some cases ultraviolet rays may have a slight therapeutic influence in this condition, such influence appears to be limited and at most irradiation is to be regarded as an adjuvant to other established methods The theory that exposure of the body to ultraviolet rays reduces blood pressure is not generally accepted While exposure of the entire body to ultraviolet rays may induce a slight reduction in blood pressure in some individuals experience shows that such reduction cannot be depended on and at any rate is too slight and inconsistent to be of clinical value

Among the diseases of the skin lupus vulgaris alone is specifically affected by ultraviolet rays In other dermatoses (scrofuloderma erythema induratum eczema psoriasis pustular folliculitis indolent ulcers furunculosis acne vulgaris angioma sperpiginosum parapsoriasis pityriasis rosea) local or general exposure to ultraviolet radiation may have a favorable action but the improvement that may result cannot be regarded as a specific effect of the rays In some cutaneous disorders (eczema psoriasis lupus erythematosus herpes simplex xeroderma pigmentosum farmer s skin prematurely senile skin) exposure to such rays may cause an exacerbation provoke an attack or produce other injurious effects Oft repeated exposures to ultra violet radiation over long periods in persons especially children who have a low tolerance to ultraviolet rays may lead to degenerative changes in the skin such as atrophy anomalies in pigmentation keratoses and even cancer Grossly

excessive exposure of the entire body may, in certain cases, cause serious illness or even death and grossly excessive exposure of a local area may, in some cases lead to permanent deleterious changes in the skin As far as normal persons are concerned the claim that exposure to ultraviolet rays increases or improves the tone of the tissues or of the body as a whole stimulates metabolism or tends to pre vent colds has not been substantiated New uses of ultraviolet and other forms of artificial radiation will be brought to the attention of clinicians if and when in the opinion of the Council on Physical Medicine the therapeutic value of such uses has been established

E HYDROTHERAPY

Hydrotherapy or the prescription of water as a therapeutic agent is one of the oldest physical measures at the physician s disposal Hot or cold water has practically the same physiologic effect on body tissues as other applications of heat or cold Water is simply an adaptable and convenient means of extracting heat from or adding heat to the body Forms of application with indications for their use are outlined here

LOCAL APPLICATIONS

Whirlpool Bath Effect is that of heat and gentle massage—for painful stumps painful and adherent scars purulent wounds indolent ulcers acute arthritis healed fractures of the extremities inflammation of joints muscles and tendons of the extremities It is often used as a preparation for massage and movement rendering them easier and less painful

Hot Fomentation Compresses Heat for relief of pain—used in lumbago bursitis and sciatica

(Compresses are generally renewed every fifteen minutes)

Hot Moist Dressings For preventing spread of infection and concentrating the area of inflammation

Sitz Bath For producing increased abdominal and pelvic circulation—in prostatitis painful hemorrhoids and dysmenorrhea

Compresses (1) head compress cold to lessen febrile headache (2) throat compress warm useful in tonsillitis and laryngitis, (3) chest compress warm useful in bronchitis and pneumonia and (4) trunk compress warm most useful form of antipyretic pack

GENERAL APPLICATIONS

Underwater Exercise Pools Used to lighten weight of parts to be exercised making possible movement which cannot take place under ordinary circumstances also for psychological effect on patient and used for muscle re-education work after infantile paralysis orthopedic operations etc

Ablution Simplest form of antipyretic treatment

Sheet Bath Same purpose as above

Drip Sheet Bath Useful in chronic arthritis

Full Wet Pack Useful in insomnia nephritis arthritis psychoses and psychoneurosis Contraindicated in circulatory disturbances cardiac derangement in extreme exhaustion and when reaction would be problematical

Continuous Tub Useful for sedative effect in nervous conditions or in extensive burns

Douches and Showers Useful in nervous conditions

Various other types of baths are used including carbon dioxide baths oxygen baths pine needle and herb baths wheat and malt or starch and

mustard baths The last named is used for con vulsions or collapse in infants Further details concerning the technic of application of these baths and physiologic effects may be found in the Hand book of Physical Medicine

F FEVER THERAPY

The production of artificial fever by physical means for therapeutic purposes or fever therapy has aroused considerable interest recently There is still some divergence of opinion concerning the effectiveness of this means of fever production as compared to malarial inoculations or injections of foreign proteins The application of fever therapy is strictly a hospital procedure It should be attempted only by well trained personnel under the direction of a physician who should be in constant attendance and a skilled nurse technician

There are several accepted methods for produc ing artificial fever by physical means Radiant heat may be used either in the form of luminous or non luminous heat cabinets with or without air conditioning High frequency electrical current as utilized in either the conventional diathermy or short wave unit serves as an efficient source of heat Hot baths are also employed principally for temperatures reaching 39 5° C or 103 F but are avoided when higher temperatures are desired

While fever therapy has been applied in many conditions it is believed at the present time that the chief indication for such a procedure is gonor rheal complications Combined fever chemotherapy is of value in syphilis of nervous system ocular syphilis and chorea Contraindications are ad vanced age (60 years is the arbitrary limit) car diac or renal insufficiency rheumatic heart disease aortic aneurysm advanced arteriosclerosis pul

monary tuberculosis, diabetes, and neuro syphilis progressed to complete dementia Further information in regard to the present status of fever therapy may be procured from the Council on Physical Medicine

C LOW FREQUENCY AND CONSTANT CURRENT

Currents included in this classification are of unquestionable value in treating a limited number of conditions They may be direct or alternating galvanic current and interrupted or pulsating unidirectional currents are direct while faradic and true sinusoidal currents are alternating currents Faradic current is used to stimulate muscles which are poor in tone but which have the nerve supply intact The galvanic current is used to produce contractions in paralyzed muscles The galvanic or constant current is also employed to deposit the ions of certain salts in solution on or in the tissues so called ion transfer or electrophoresis depending on the type of electrolyte used Sinusoidal or other forms of wave currents have only the advantage of relative painlessness Further information in regard to low frequency currents their physiologic effects and application mav be obtained from the Council on Physical Medicine

Part VIII

LAWFUL SCOPE OF INTERN PRACTICE[1]

In a number of states interns are under the provisions of the medical practice acts placed in a class by themselves They are not licensed to practice medicine but so long as they function as interns the general provisions of the medical practice acts do not apply to them This latitude of action is permitted in order that interns may fit themselves under proper professional guidance for the practice of medicine

The latitude allowed however tolerates no practice outside of the intern relationship except the privilege of rendering gratuitous services in cases of emergency and with respect to emergencies the privilege of an intern does not differ from the privilege of any other unlicensed person The status of the intern under these exemption provisions in the medical practice acts may be broadly defined as covering diagnosis and treatment under the qualified professional guidance and full responsibility of the institution and the person or persons who have assumed the duty of such guidance

An intern doubtless has a wider range of lawful function when the medical practice act of the state

1 Based in part on article entitled Practice of Medicine by Medical Students and Unlicensed Hospital Interns and Resident Physicians prepared by the Bureau of Legal Medicine and Legislation American Medical Association J A M A 110 18B–20B (Jan 15) 1938 The excerpts from state laws have been revised to reflect changes as of December 1947

specifically or impliedly *exempts him from its re quirements* than he has in a state in which the medical practice act contains no such exemption Functioning in a state in which the medical prac tice act *contains an exemption, he is within* the limits defined in the act freed from some or all the restrictions of the act He may within such limits presumably make diagnoses and direct treatment and be held responsible for the results of his own negligence in connection therewith although the hospital by which he is employed and possibly those of its officers charged with the duty of super vising his activities may also be legally responsible for the consequences of his work As contrasted with this an unlicensed intern in a tate in which the medical practice act contains no express or implied exemption is as much restricted in medical work as is any unlicensed person and it is believed can perform only functions that do not require the exercise of the professional judgment of a lawfully practicing physician

An implied exemption from the provisions of medical practice acts in favor of interns may obtain in those states in which an internship is by law or by a validly promulgated regulation imposed as a condition to medical licensure It has been held that the exaction of an internship requirement im pliedly gives legal sanction to the performance of such duties on the part of interns as are usually and *ordinarily performed by them*[2] *According* to the files of the Council on Medical Education and Hospitals (1947) internship as a condition precedent to medical licensure is required either by law or by *regulation* in the following 23 states and in the District of Columbia

2 Nickley v Skemp 239 N W 426 decided by the Supreme Court of Wisconsin 1931

Alabama	North Dakota
Delaware	Oklahoma
District of Columbia	Oregon
Idaho	Pennsylvania
Illinois	Rhode Island
Iowa	South Dakota
Michigan	Utah
Montana	Vermont
Nevada	Washington
New Hampshire	West Virginia
New Jersey	Wisconsin
New Mexico	Wyoming

Below will appear an analysis of the provisions of the medical practice acts of the several states under which interns medical students or resident physicians are granted specific exemption All interns who contemplate the serving of an internship in any of these states should familiarize themselves with these provisions so that they may comply with all the requirements necessary to the enjoyment of the exempt status

California Deering s Business and Professions Code of California 1937 sec 7147 5 as amended

Any graduate student egi te ed with th boa d and upon whom degree of doctor of med cine ba helor of med cine or docto of osteopathy ha been onferred by a school approved by the board and any egul rly matriculated student in a school approved by the board may during and as a part of his course of tudy but ot for a pe iod of m re than two years tre t the ck and afflicted either as s ch tudent in a chool appro ed by the bo rd teaching medic ne urgery or o teop thy n this State or as n interne in a h sp tal ppro ed for the tr ini g of internes and may for r der g u h tre t nent receive compen tion the efor t om the ho pit l o hool Ho pit l t t oning as part of the t a h g p ogr m of an p o d hool n thi St te may change i tr ctor or e dent or t nt re dent phy ici n w th an out of tat app o d cho l and th xch ng in tr tor dent or a t nt r d nt f m h o t of tat hool m for pe od not exceedi ng one y r er e a n in tructor re d nt or a tant re ident n uch hospit l n this State Any per on reg te ed with th boa d nd upon whom a

degree of doctor of medicine or doctor of osteopathy has been conferred by a school approved by the board may act as a resident or assistant resident physician in any hospital approved for residencies or the training of internes and may receive compensation therefor from the hospital provided that any such resident or assistant resident shall qualify for and take the next succeeding examination for a physician and surgeon s certificate given by the board If he shall fail to pass such examination all privileges under this section shall automatically cease

Except to the extent authorized by this section no graduate student may treat the sick or afflicted or receive compensation therefor or otherwise engage in or offer to engage in the practice of medicine or surgery unless he shall hold a valid unrevoked and unsuspended physician s and surgeon s certificate —(Laws 1947 chap 867 sec 1)

Connecticut General Statutes of Connecticut 1930 chap 152 sec 2740 as amended and Section 1 chapter 385 Laws of 1943 respectively

No provision of this section shall be construed to prevent any student in or graduate from any school or institution giving instruction in the healing arts approved as provided in the statutes from taking supplementary training with any regularly licensed and reputable practitioner or from serving as intern in a hospital (As amended Public Act No 438 Laws of 1945)

Any graduate of a medical school approved as provided in section 478t of the 1941 supplement to the gen ral statutes may serve as a resident physician in any state aided hospital for the duration of the war and for not more than six months thereafter provided he shall obtain the written consent and approval of the Connecticut medical examining board (Section 1 Public Act 385 Laws of 1943)

Delaware Revised Code of Delaware 1935 chap 27 sec 928

Interns upon whom the degree M D has been conferred by a legally recognized medical school are permitted to engage in the practice of medicine and surgery in institutions but they must confine their activities to the ward of the hospitals with which they are connected except that they may assist during such internship a licensed physician or surgeon in his private practice

Physicians practicing as hospital interns must register with the Secretary of the Medical Council

In order to so register they must submit satisfactory evidence that they had obtained the degree of M D Any of the following are accepted as satisfactory evidence

1 License from another state

2 A diploma from a recognized medical school

3 A letter from the Dean of a recognized medical school stating that the degree of M D has been conferred upon the applicant after the completion of the required course

The Secretary of the Medical Council shall immediately notify the Secretary of the State Board of Health of all such registrations granted

Florida Florida Statutes 1941, chapter 458 section 458 13

This chapter shall not be construed to affect any one while actually serving without salary or professional fee on the resident med cal staff of any legally incorporated hospital

Idaho Idaho Code Annotated 1932 Title 53 chapter 21 section 53 2102 as amended

Provided however that this Act shall not have application to students who have had training in recognized medical colleges in good stand ng and who are performing the duties of an intern in the State Hospital South the State Hospital North the Idaho State School and Colony or any duly organized hospital with n the State of Idaho operating under the supervision of a medical staff who have been duly licensed to pra tice medicine and surgery within said State Any such intern shall be permitted to freely perform such duties without an examination or the issuan e of a license (as amended Laws 193? chap 52 sec 1)

Indiana Burns Indiana Statutes Annotated 1933 Title 63 sec 63–1310

This act shall not be construed to prevent med cal students from practicing medicine and surgery under the immed te and direct supervision of a licens d phy ician for a limited period of two years pro id d however that the sa d student had not prac ticed medicine s rgery or ob t trics prior to the pas ge of this act in that event the amount of time said student has practiced medicine surgery or obstetrics shall be deducted from the said

two years herein mentioned and in no event shall the said student open an office or offer to engage in the practice of medicine surgery or obstetrics

Iowa Code of Iowa 1946 Title 8 Chap 148 sec 148 2

The preceding section [defining persons engaged in the practice of medicine] shall not be construed to include the following classes of persons

3 Students of medicine or surgery who have completed at least two years study in a medical school approved by the medical examiners and who prescribe medicine under the supervision of a licensed physician and surgeon or who render gratuitous service to persons in case of emergency

Louisiana Dart s Louisiana General Statutes 1939 title 62 chap 31 sec 9661

This law shall not apply to any one serving full time without salary or professional fees on the resident medical staff of any legally incorporated municipal or state hospital or asylum

Maryland Annotated Code of the Public General Laws of Maryland 19 article 43 sec 139

but nothing herein contained shall be construed to apply to any resident or assistant resident physician or students at hospitals in the discharge of their hospital or dispensary duties or in the office of physicians

Massachusetts Annotated Laws of Massachusetts and Cumulative Supplement 1946 chap 112 sec 7, sec 9 and sec 9a

Sec 7 They [section 2 to 6 and section 8] shall not apply to an intern or medical officer registered as provided in sec 9 while engaged in the practice of medicine as authorized by said section

Sec 9 An applicant for limited registration under this section who shall furnish the board with satisfactory proof that he is twenty one or over and of good moral character that he has creditably completed not less than three and one half years of study in a legally chartered medical school having the power to

grant degrees in medicine and that he has been appointed an intern fellow or medical officer in a hospital or other institution maintained by the commonwealth or by a county or municipality thereof or in a hospital or clinic which is incorporated under the laws of the commonwealth or in a clin c which is affiliated with a hospital licensed by the dej artment of publ c health under authority of section seventy one of chapter one hundred and eleven may upon th payment of five dollars be registered by the board as a hospital medical officer for such time as it may prescribe but such limited regi tration shall entitle the said appl cant to practice med cin only in the hospital or other institution designated on his certificate of limited registration or outside such hospital or other institution for the treatment under the supervisio i of one of its med cal officers who is a d ly registered physician of persons accepted by it as patients and in either case under regulations establ shed by such hospital or other institution Limited registration under this section may be revoked at any time by the board

Sec 94 An appl cant for limited registration under thi section as an assi tant in med cine who shall furnish the board with satisfactory proof that he is twenty one years of age or over and of good moral character th t he is e rolled in and has creditably completed not less th n two years of study in a legally chartered medical school having the pow r to grant degrees in medicine and that he has be a igned to the c e and observation of persons requ ring u cal servic by an instructor in sa d med cal school which instructor shall be a reg stered physician may upon the payment of one dollar be registered by the board as n assistant in medicine for such time as it may prescribe S ch registered assistant in medicine may practice medicine as authorized by this sect on but only under the supervis on of such instructor he may however be assigned by such in tructor to a hospital recognized and approved by such nstructor of not less than twenty five beds nd may practice medicine as foresaid in said hospital but only under the super ision of a reg tered physician who has been duly appointed a staff physician in said hospital R gistrat on under this section shall not authorize the s g ing of certificates of b rths or deaths o the use of any instru m nts whatsove n the t eatme t of any ca es except instru nents norm lly ed to th p rpo e of diagnosi and then for such] rpo e nly or sh ll it authorize the prescribing or di pens g of ny n r otic dr g a defined in e tion one h ndred and ninety even of chapte n ety fou Registr tion nder th s ection may b r oked t ny time b the board and shall be r voked upon the req e t of the de n of the med cal chool in wh ch such

assistant in medicine is enrolled Termination of such enrollment shall operate as a revocation of such registration

Minnesota Minnesota Statutes, Annotated chap 147 sec 147 09

This subdivision shall not apply to students practicing under the direct supervision of a preceptor while they are enrolled in and regularly attending a recognized medical school

Nebraska Statutes of Nebraska 1943 chap 71 sec 71-1 103 as amended

The preceding section [defining the practice of medicine and surgery] shall not be construed to include the following classes of persons

4 Students of medicine and surgery who have completed at least two years study in an accredited school and who gratuitou ly prescribe for and treat disease under the supervision of a licensed physician or while serving an internship in an accredited hospital

New Hampshire Revised Public Laws of New Hampshire title XXI chap 250 sec 18

This chapter shall not apply to any one while actually serving on the resident medical staff of any legally incorporated hospital

New Jersey Revised Statutes of New Jersey 1937 title 45 sec 45 9-21 as amended

The prohibitory provision of thi chapter shall not apply to the following

d A person while actually serving as a member of the resident medical staff of any legally incorporated charitable or municipal hospital or asylum approved by the board Hereafter such ex emption of any such resident physician should not apply with respect to any individual after he shall have served as a resident physician for a total period of two years and such exemption of resident physicians except with respect to persons who shall have commenced service as resident physicians prior to July first one thousand nine hundred and thirty nine shall apply only to

persons who have been issued certificates under provi ions con tained in Section 45 9 8 of this Title

(as amended Laws 1939 chap 115 sec 28)

New York McKinley s Consolidated Laws of New York, Annotated Article 131 Sec 6512 as amended

This article shall not be construe to affect or prevent the following (2) the practice of medicine in a legally incorporated hsopital by a physician duly appointed as a member of the resident staff or by an intern while actually serving in a state hospital or that of a political subdivision of the state or other state institution in which medical service is furnished (As amended Ch 414 Laws of 1941 and Ch 593 Laws of 1942)

[Note The following amendment modifying (2) and adding (10) originally enacted in 1940 b t the effective date of which has been repeatedly postponed by the legislature will by virtue of chapter 506 Laws of 1947 become operative on July 1 1948]

This article shall not be construed to affect or prevent the following (2) the practice of medicine in a legally incorporated hospital by a physician duly appointed as member of the resident staff or by an intern while actually serving in a state hospital or that of a political subdivision of the state or other state institution in which medical serv ce i furnished provided the said duly appointed member of the resident staff or intern has com pleted not less than four sati factory courses of at least eight months each in a medical school in this country or Canada regis tered as maintaining at the time a standard satisfactory to the department or in a medical school in a fore gn country main taining a standard not lower than that p escribed for medical schools in this state or has rece ved the degree of bachelor or doctor of med cine from some med cal school in this country or Can da reg stered as maintaining at the time a standard satis factory to the department or a med cal degree or diploma f om a medical school in a foreign co ntry maint ining a standard not lower than that prescribed for med c l schools in this state or a license to p act e medicine n a fore gn co ntry issued under require nents not lower th n those exacted for a medical license in th s state (10) m dical students performing clinical clerk hips or sim lar functions in a leg lly incorporated hospital state hospital or other state instit tion provided such students are m triculated and enrolled in a medical school in this co ntry or Canad registered s maintaining at the time a standard satis

factory to the department or in a medical school in a foreign country maintaining a standard not lower than that prescribed for medical schools in this state (This act does not take effect until July 1 1918) (As amended Laws 1940 Chap 761 Laws 1942 Chap 902 Laws 1943 Chap 193 Laws 1944 Chap 69 Laws 1945 Chap 313 Laws 1946 Chap 121 and Laws 1947 Chap 506)

Oregon Oregon Compiled Laws Annotated 1940 title 54 chap 9 sec 54 902

This act shall not be construed to affect or prevent the following (2) the practice of medicine and surgery by a duly appointed member of the resident staff or by an intern while actually serving as such in any legally incorporated hospital in this state recognized as standard by the order of the state board of medical examiners

Pennsylvania Purdon's Pennsylvania Statutes Annotated Permanent Edition title 63 chap 10 sections 405 and 409 *as amended*

Sec 405 This act shall also be construed as applying to hospitals employing on salary graduate interns whose services are confined to the said institutions when they assume individual responsibility in the care of patients (As amended Laws 1935 p 1379)

Sec 409 provided that this *section relating* to certificates *to practice med*icine and surgery shall *not apply to* any one while actually serving as a resident intern under the supervision of the medical or surgical staff of any legally incorporated hospital or state hospital (As amended 1941 August 6 PL 903)

Virginia Virginia Code of 1942 and 1946 Cumulative Supplement chap 68 sec 1621

Exceptions and exemption (a) nothing herein shall affect *or interfere* with the following persons within the scope of their usual professional activities intern and resident physicians while serving as such in legally incorporated hospitals

(b) Nothing in this chapter shall be construed to affect or interfere with the operation of any hospital now established in this State nor with any person while engaged in conducting any *such hospital* if there be a licensed practitioner resident or practicing therein

Part IX

THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association is a federation comprising over 135 000 member Component County and District Societies (numbering 2 024) make up subdivisions of 53 State and Territorial Associations Through membership in these organizations membership in the American Medical Association is automatic The Association is designed as a democratic form of organization The component county medical societies appoint the delegates to the House of Delegates of the various state and territorial associations The House of Delegates of the American Medical Association which establishes the policies of the Association is composed of delegates chosen by the respective State and Territorial Medical Associations The American Medical Association is governed by the House of Delegates the Board of Trustees acting as the governing body in the interval between the annual sessions of the House of Delegates Directly responsible to the House of Delegates are the Judicial Council the Council on Medical Education and Hospitals the Council on Medical Service and the Council on Scientific Assembly Responsible to the House of Delegates through the Board of Trustees are those concerned with the publication of The Journal of the American Medical Association and the special journals as well as the Association Library the Committee on Scien

the Exhibit the Council on Pharmacy and Chemistry Chemical Laboratory the Bureau of Investigation the Bureau of Health Education the Bureau of Legal Medicine and Legislation Council on Physical Medicine Council on Foods and Nutrition Council on National Emergency Medical Service the Bureau of Medical Economic Research the Council on Industrial Health and several special committees The Association also maintains a biographical record of physicians

The annual sessions of the Association are held in various sections of the United States and are more largely attended than any other medical meetings The scientific programs are presented through the seventeen Sections of the Scientific Assembly The Scientific Exhibit is an important and distinct feature each year and the Technical Exhibit is always comprehensive and complete The social features of the annual sessions are delightful

Fellowship in the Association is separate from membership and includes subscription to THE JOURNAL or one of the special journals participation in the scientific work of the Association eligibility to office and other privileges

The headquarters of the American Medical Association are located at 535 N Dearborn St Chicago Ill The Bureaus and the Councils as well as certain other departments of the Headquarters are described herewith

Council on Medical Education and Hospitals

This body has notably advanced the standards of medical education Extensive information concerning schools and students of medicine is filed in the secretary s office

In cooperation with state licensing board the Council works to secure better reciprocal relations

between the states and to improve medical practice laws

Another important phase of the Council s work is the collection and dissemination of information about hospitals It maintains lists of (a) registered hospitals (b) hospitals approved for the training of interns and (c) hospitals approved for the training of residents in various branches of medicine

The Council on Pharmacy and Chemistry

This council was created in 1905 to advise the profession concerning drugs it is importuned to use but in more recent years its scope of activities has broadened to include other efforts Drugs and allied substances that are used for the prevention diagnosis and treatment of disease which are found to comply with the Council rules are accepted for inclusion in the annual publication New and Nonofficial Remedies This volume includes the therapeutic uses of the accepted items as determined by the Council in the consideration of acceptance Reports by the Council appear regularly in the columns of THE JOURNAL Useful Drugs Epitome of the U S Pharmacopeia and National Formulary the annual reprint of Council on Pharmacy and Chemistry Reports Glandular Physiology and Therapy and in part the A M A Interns Manual also are published under the auspices of this Council One of its committees is the Therapeutic Trials Committee which was created to orgnize medical research on agents of promise Another standing committee is the Committee on Therapeutic Research which encourages investigators in therapeutics by providing funds for research Speakers on topics that come within the purview of the Council are available on request Inquiries concerning data available in the Council files are welcomed as is the case for other A M A offices

Chemical Laboratory

The Chemical Laboratory of the American Medical Association is well equipped for macro and micro analysis spectrography and problems dealing with the examination of drugs and elaboration of standards Most of its work is for the Council on Pharmacy and Chemistry in determining the chemical composition and purity of new drugs included in New and Nonofficial Remedies For the Bureau of Investigation it supplies chemical data to be incorporated in reports prepared by that Bureau It does no commercial work No work is done for individual physicians as the problems investigated are those of interest to the profession at large

Bureau of Investigation

The Bureau of Investigation is a clearing house of data on patent and proprietary medicines all forms of quackery fake cures medical fads and pseudo medicine Any physician desiring specific information on such preparations or individuals engaging in quackery or pseudo medicine is urged to write to the Bureau asking for details and fact

Bureau of Health Education

The Bureau of Health Education seeks to educate the public through the columns of HYGEIA The Health Magazine by the dissemination through lay publication of carefully prepared article through a series of instructive pamphlet written by recognized medical authoritie through several ct of health posters and by radio program of interest to lay person The Bureau also furnishes speakers and offer assistance to the medical profession locally in the compilation of material for addresses on health topics by supplying abstracts and outlines

Radio material is available to physicians for local use The Bureau also cooperates through advisory relationships with federal and state health authorities and voluntary health organization

Bureau of Legal Medicine and Legislation

This Bureau keeps in touch with legislation and court decisions of medicolegal interest such as those relating to the prescribing and dispensing of narcotics and other drugs income and other taxes relating to the practice of medicine quarantine laws vaccination medical malpractice protection of scientific research workmens compensation and so on Information collected by the Bureau is available to all Fellows and members of the Association The Bureau does not undertake to give legal advice concerning specific problems of personal concern only

Council on Physical Medicine

The Council on Physical Medicine was created to advise the medical profession concerning the status of apparatus used in physical medicine to protect the medical profession and the public against misleading and deceptive advertising in connection with the manufacture and sale of devices used for this purpose and to assist in placing this mode of treatment on a scientific ba is The Council includes among its members physicist physiologists pathologists and clinicians Apparatus for physical medicine is considered and reported on in THE JOURNAL and subsequently collected in the booklet Apparatus Accepted

Council on Foods and Nutrition

The Council on Foods and Nutrition was created primarily to advise the medical profession and the

public concerning the nutritional value of food products The Council strives to prevent or discourage unwarranted incorrect or false advertising claims in the promotion and merchandising of foods To this end the claims made for food products are examined in the light of available evidence and according to rules adopted in the interest and for the protection of public health and welfare Reports providing information about food products and the nutritional claims made for them appear in THE JOURNAL

Bureau of Medical Economic Research

The Bureau of Medical Economic Research is established to study subjects pertaining to the economics (supply and demand) of the practice of medicine

Council on Industrial Health

The Council on Industrial Health has been organized with the view of improving standards in the field of industrial medicine Its principal functions are to inform the profession of developments in the industrial field of medical or medico social nature to foster research in and stimulate provision of training in special fields and to encourage protective measures in industrial health consistent with the ethical and scientific program of the American Medical Association

Biographical Department

The Biographical Department serves as a clearing house of detailed verified information on physicians in the United States its dependencies and Canada Its card records show the physician s date of birth, preliminary and medical education hospital training medical society affiliations specialty certifica

tion by specialty board and location Information is added to these cards from year to year throughout the physician s life It is from these records that the biennial AMERICAN MEDICAL DIRECTORY is compiled

The American Medical Association Library

The library of the American Medical Association is planned primarily as a reference library for the headquarters office and for rendering service to the medical profession About 1 500 medical journals domestic and foreign are regularly received The abstracts of many of them are made available to physicians through the columns of THE JOURNAL An index of the articles currently published by both subject and author is provided through the Quarterly Cumulative Index Medicus Any member of the American Medical Association may use the facilities of the library which will supply him on request with a list of references to books and articles on any medical subject Journals on file in the library may be borrowed for three days on request accompanied by 6 cents to cover cost of postage A package library service has been established through which members of the Association may secure for temporary use reprints or original articles on general medical subjects

Publications

By operating its own printing plant the Association is able to furnish medical publications at a great saving This department includes extensive type equipment, linotype machines flatbed and rotary presses and necessary bindery machinery for producing medical journals books pamphlets and supplies on a large scale and at a reasonable cost However the tremendous demands for printing make

it necessary also to use outside printing establishments *Hygeia* the lay health journal compares with THE JOURNAL in quality Special journals are *Archives of Internal Medicine American Journal of Diseases of Children Archives of Neurology and Psychiatry Archives of Dermatology and Syphilology Archives of Surgery Archives of Otolaryngology* and *Archives of Pathology Archives of Ophthalmology and Occupational Medicine*

In addition to the regular periodicals including the Quarterly Cumulative Index Medicus issued by the Association hundreds of thousands of circulars reprints leaflets and posters bearing on medical and health topics are printed and distributed annually

Council on Scientific Assembly

This Council arranges the programs of the general meetings of the Scientific Assembly and coordinates the various sessions

Committee on Scientific Research

This Committee encourages research through grants in aid

Bureau of Exhibits

The Bureau provides exhibit material It directs the Scientific Exhibit at the annual and interim sessions of the American Medical Association and provides exhibit material for medical and other meetings

Committee on Medical Motion Pictures

This Committee serves as a clearing house for information on medical motion pictures and distributes films on a loan basis

Judicial Council

This is a special Council to adjudicate all ques tions of ethics and to interpret the laws of the American Medical Association

Council on Medical Service

This Council was formed to study and encourage among other things the correlation and exten ion of voluntary prepayment medical care plans

Council on National Emergency Medical Serv ice

This Council considers matters pertaining to the supply and demand of medical services during na tional emergencies

Committee on Rural Medical Service

This Committee gives attention to the need for medical personnel and treatment facilities in rural areas

Other offices are concerned with the functioning of the association but are omitted from these de scriptions as they relate primarily to administrative activities

In Conclusion

The Association functions not only in behalf of the general public and the profession at large but also in behalf of the individual physician (For further details see The Individual Physician and the American Medical Association A M A Press) It cooperates with state medical associations and county medical societies for the promotion and wel fare of each physician The benefits from its various councils from its resources and its facilities are real and tangible To take a full share in con

tinuing and expanding its activities is the privilege of each physician who is a member, in good standing of his county and state medical organizations The annual dues for Fellows of the Association are $12 00 This includes subscription to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION The subscribers to THE JOURNAL now total over 130 000 The number of physicians holding American Medical Association Fellowship cards exceeds 75,000

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ATLAS
OF
CONGENITAL CARDIAC DISEASE

MAUDE E. ABBOTT